DOCUMENT RESUME

ED 313 816 EC 212 278

TITLE	Rehabilitation Technology Service Delivery, 1: A Practical Guide.
INSTITUTION	RESNA: Association for the Advancement of Rehabilitation Technology, Washington, DC.
SPONS AGENCY	National Inst. on Disability and Rehabilitation Research (ED/OSERS), Washington, DC.
REPORT NO	ISBN-0-932101-14-3
PUB DATE	87
GRANT	G008535151
NOTE	184p.; For related document, see EC 212 279.
AVAILABLE FROM	RESNA, Department 4813, Washington, DC 20061-4813 ($18.00).
PUB TYPE	Guides - Non-Classroom Use (055)
EDRS PRICE	MF01/PC08 Plus Postage.
DESCRIPTORS	*Business Administration; *Disabilities; Financial Policy; Fund Raising; Marketing; *Program Development; *Program Implementation; *Rehabilitation; *Technology; Trend Analysis
IDENTIFIERS	*Rehabilitation Technology

ABSTRACT

The guide consists of six author contributed chapters and is intended to aid in the development of new rehabilitation technology service delivery programs as well as increasing the effectiveness of existing programs. The first chapter, by Roger Smith, describes and evaluates seven models of service delivery in rehabilitation technology. Chapter 2, by Phil Mundy, is concerned with marketing, including management and organization, the needs analysis market study, products, the marketing plan, and ongoing market evaluation. The next chapter, by Douglas Hobson and Carl Gregory Shaw, considers program development and implementation based on the seven models described earlier. John Leslie addresses the application of such business practices as fiscal management and control to rehabilitation technology services in the fourth chapter. The fifth chapter, by Samuel McFarland and Kenneth Reeb, Jr., discusses funding sources and strategies, including estimating financial needs, finding start-up funding sources, and generating revenue. In the next chapter, Hugh O'Neill provides a rehabilitation technology case study to illustrate business practices in seating service delivery. A final chapter, by Alexandra Enders, lists resources including acronyms, addresses of authors, marketing references, funding sources for rehabilitation technology, government agencies, national organizations, and statistical information resources. (DB)

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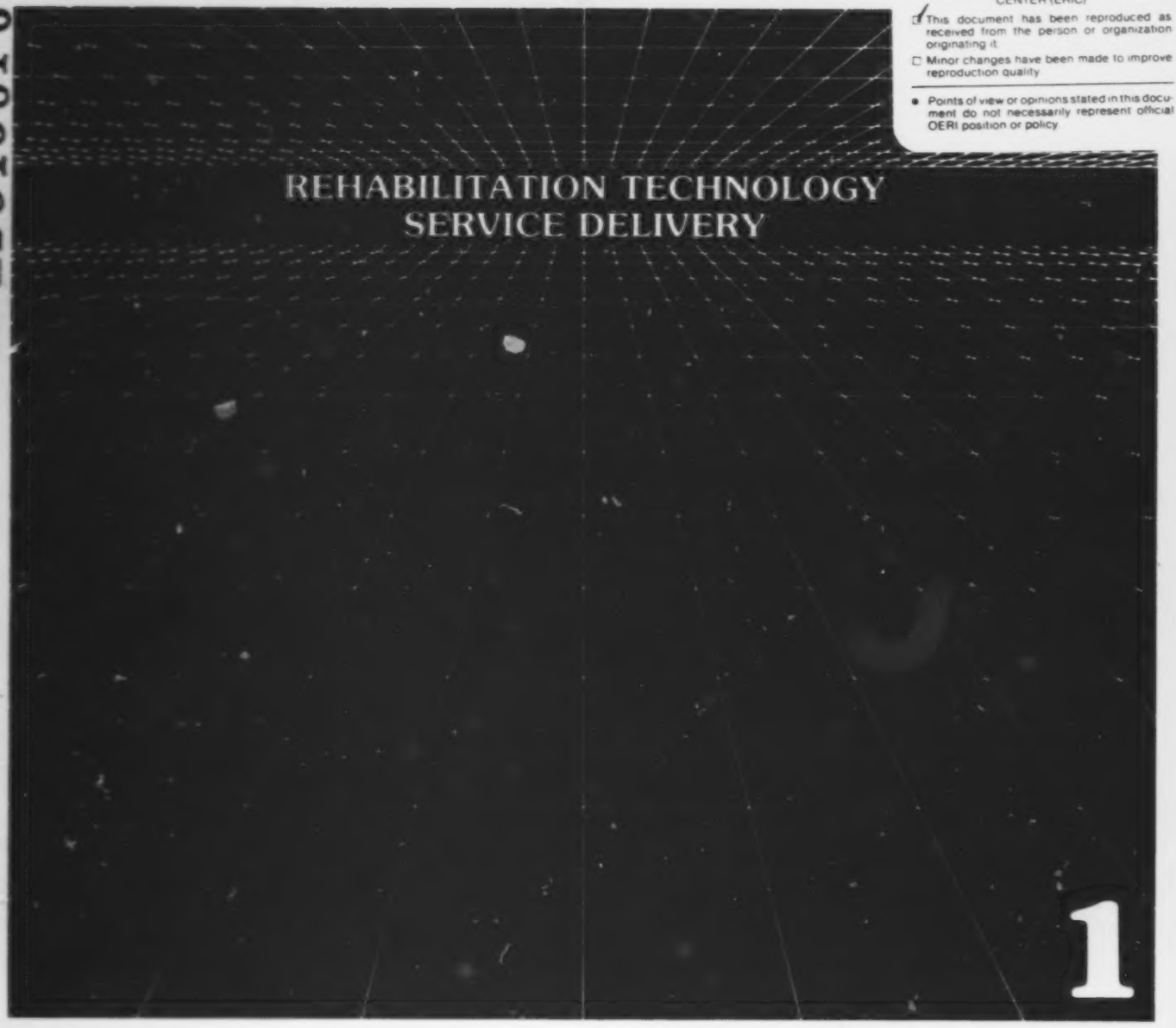

A PRACTICAL GUIDE

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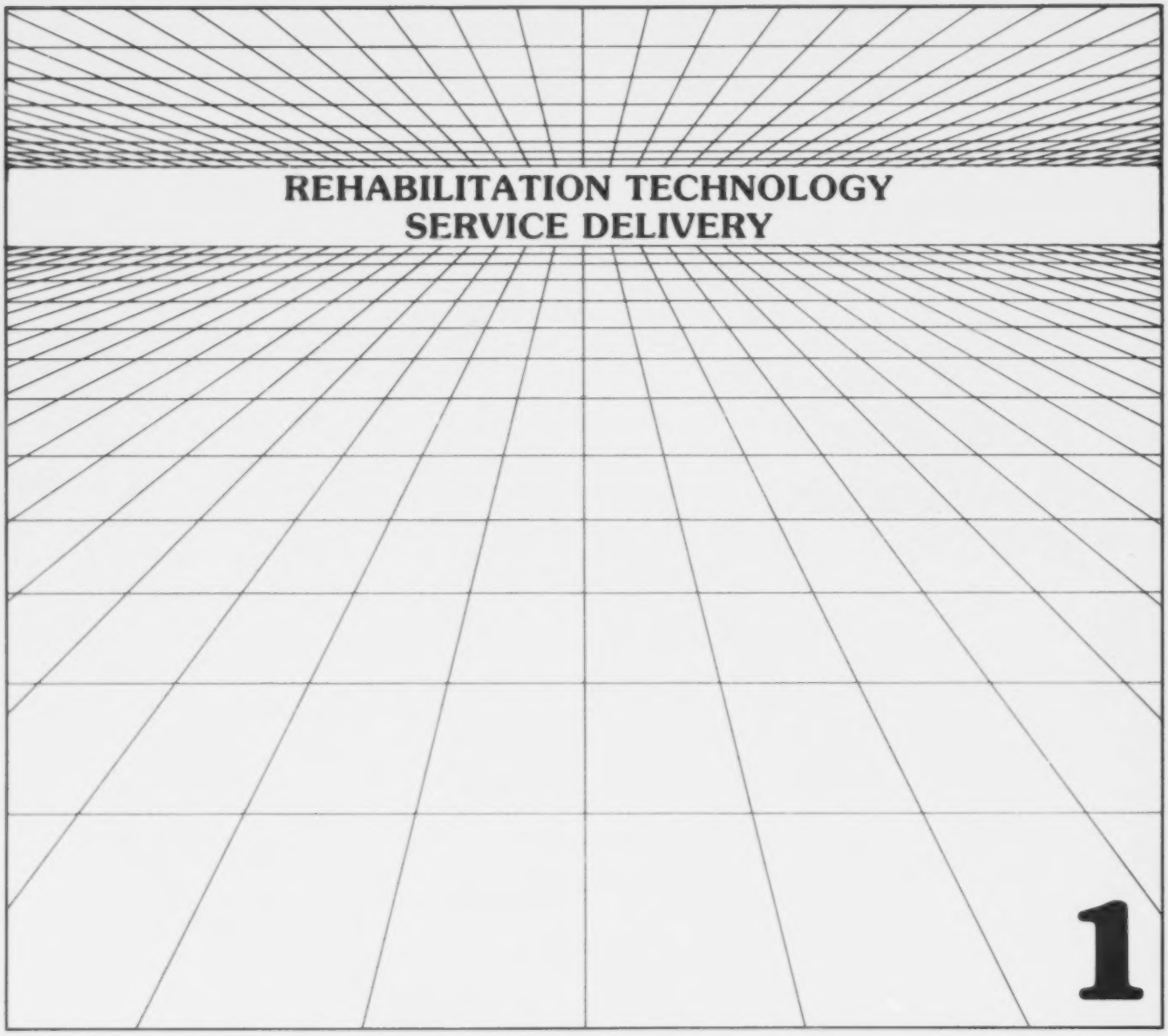

A PRACTICAL GUIDE

RESNA

Association for the Advancement of Rehabilitation Technology, Publishers
Suite 700, 1101 Connecticut Avenue NW, Washington, DC 20036
(202) 857-1199

Rehabilitation Technology Service Delivery:
A Practical Guide

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This work was supported in part by Grant No. G008535151
from the National Institute on Disability and Rehabilitation Research,
Department of Education.

RESNA, Suite 700
1101 Connecticut Avenue NW
Washington, DC 20036
(202) 857-1199

Printed in the
United States of America

ISBN 0-932101-14-3

FOREWORD

This publication represents the cornerstone of a new era in rehabilitation engineering and technology. We have surpassed the eras that focused on producing new technology, defining consumer needs, and technology transfer. We are coming to grips with what we know now to be a pivotal aspect of using technology to meet the needs of disabled people. We have solidly entered the era of service delivery.

For many years we have had a "funnel" full of technologies intended to meet the needs of disabled people. It was always properly directed at the disabled population; however, there has been a constant frustration with the very small aperture of that funnel. "Technology Transfer" was our last major focus on reducing the flow restriction. Even with that concerted effort we did not achieve the desired goal of making technology as available as it needs to be. We did, however, move a major step closer to understanding the requirements for achieving the objectives. We now clearly understand those requirements to be founded in service delivery.

It has become clear to everyone that providing equipment alone does not create a solution. In most instances, services must be part of the solution implementation if the appropriate outcome is to be achieved. Currently, technology must be tailored to fit the needs of the disabled individuals. "Ready to wear" technology continues to emerge for people with less severe disability and it will continue to develop and become more available as time goes on.

Establishing rehabilitation technology service delivery will require development of many new roles and the modification of many others. Of utmost importance is the development of the appropriate manpower to provide service delivery and, second, development of methods that will make it happen with the highest standards of quality assurance.

In addition, establishing such a system will require pre- and post-service training of a wide variety of rehabilitation professionals, creating an understanding and confidence of third-party payers, and development of realistic and appropriate expectations among disabled people, their families, and employers.

All these tasks are yet ahead of us and this publication is our first major step toward the goal of achieving quality service delivery of rehabilitation technology.

C. Gerald Warren
President
RESNA, Association for the
Advancement of Rehabilitation Technology

November 1987

Acknowledgments

Editorial consultation by
Leonard G. Perlman, Ed.D.,
and Alexandra Enders

Typesetting and layout by
Christine Thompson
and Susan P. Leone

Cover design by
Scott R. Bauer

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OVERVIEW

Alexandra Enders

Rehabilitation Technologies: A New Concept

One of the most interesting features of the disability technology business is the variety of permutations that has emerged. Rarely do we find an exemplary program that is purely one thing or another, or one that employs only one type of professional. These hybrids make it confusing to categorize the field. This difficulty of fitting technology services into neat boxes, however, demonstrates well the widely pervasive range of technology need and the demand for services. When exemplary models are examined, one also sees creativity and entrepreneurship that bodes well for the flexibility and viability of the field.

The field of technology services is broad and is emerging from several different arenas, responding to different demands and varying needs. Some of the practitioners may not have yet recognized that they all belong under the same broad umbrella of Rehabilitation Technology Services. Some programs have emerged from the traditional field of prosthetics/orthotics, others from the durable medical equipment industry. Interest in job site modification spurred some, others developed along with the advances in technology, e.g., augmentative communication, or specialized vehicles. Some have a strong architectural/design flavor, others respond to certain populations, such as farmers or children. Some are for profit, others are in the public sector. Some are heavily oriented toward information provision, whereas others primarily sell quality assurance and case review.

What we are now generically calling "rehabilitation technology services" have been provided under various other names for many years. The practice may not be new, but the necessity for a conceptual change is. "What has changed significantly in the past several years is the nature of the technology available for helping persons with disabilities. . . and the environment in which rehabilitation services are provided" (Rehabilitation Technologies, Thirteenth Institute on Rehabilitation Issues, 1987). Engineering has been and continues to be one of the essential components of rehabilitation technology, both in R&D and in service delivery.

Increased attention to the field of rehabilitation technology services has also been spurred by provisions contained in the Rehabilitation Act Amendments of 1986. The Amendments placed new emphasis on these technology-related services by requiring state vocational rehabilitation agencies to formally incorporate them into state plans and Individual Written Rehabilitation Plans. Proposed legislation in the 100th Congress holds promise for establishing or expanding technology services for individuals with developmental disabilities and older Americans, as well as authorizing assistive device resource centers to be established in each state.

The Nature of This Book

This Guide was written based on practical experience, not just on theory. All of the writers are active rehabilitation technology service delivery providers. It is based on the experiences of more than 30 exemplary programs. It does not give dogmatic "recipes for success," but instead emphasizes the necessary questions to be addressed in planning, developing, and implementing a technology service delivery program. It also includes experience-based "rules of thumb," and a chapter that describes other resources and where to find them. This book was developed to document the current

state of the art in rehabilitation technology service delivery, and to create a manual that would help in the development of new rehabilitation technology service delivery programs, as well as increasing the effectiveness of existing programs. We hope that the book will encourage innovation. You are, however, cautioned against trying to use it as a blueprint for rigid duplication of any existing program.

This Guide is a snapshot of current and past events, synthesizing the experiences of established programs. However, it must be kept in mind that this is a dynamic field, there are new models emerging. Some have not had sufficient visibility nor track record to get into the "literature" or the network. There are new settings and styles appearing: e.g., Independent Living Centers, Special Education Resource Centers, computer groups, volunteer groups, etc. This book draws more heavily from the "established" programs and models because there was an operational history to extract from. The Case Study is from the field of seating, one of the more developed areas of services.

You are also encouraged to read Planning and Implementing Augmentative Communication Service Delivery, Proceedings of the National Planners' Conference on Assistive Device Service Delivery (available from RESNA) as a companion piece to be used with this Guide. Its emphasis is on the technology delivery system focused on children/education, with particular consideration to communication aids, computer access, etc. However, the issues addressed in the Proceedings have application to other areas and settings in rehabilitation technology service delivery. Further, it brings the wisdom of service delivery program developers and practitioners who often are not heard from in the more traditional adult rehabilitation environment.

The Business of Providing Technological Support to Disabled People

You will notice a shift in terminology, from rehabilitation engineering to rehabilitation technology. Following RESNA's lead in renaming itself the Association for the Advancement of Rehabilitation Technology, this shift in language reflects the actual state of the art as practiced "out in the trenches." Using the terms "technology" and "services" simply reemphasizes the broader context within which the engineering contribution is made, and should refocus attention from the device to the continuity of services needed to appropriately apply technology. It also should provide the basis for increased collaborative effort and cooperation in integrating technological support services into the classroom, work sites, and residences of individuals with disabilities.

Both the heightened awareness of the apparent need for change in terminology and the observable increased interaction among various technology-related organizations and individuals became clear during the Rehabilitation Technology Service Delivery Symposium in Arkansas, September 19-23, 1986. The 30 invited participants represented exemplary models of the major service delivery approaches in the United States and Canada. They were convened to discuss the operational aspects of their programs. Participants appeared to recognize, only after a short time together, that they were indeed all in the same business. Their approaches and fiscal orientations were sometimes radically divergent, but their common underlying purpose for being in business was to provide technological support to disabled people. Many of the symposium participants were not engineers, and many did not have engineers on their staffs. Some had considered the term "rehabilitation engineering" as being very narrow and not being applicable to them even when they were actively engaged in applying the results of engineering efforts. Some had expressed concern, before the symposium, that they did not see where they fit into our organizational plans or per-

haps even the rehabilitation technology field. The symposium was structured to collect and develop information for this Guide. Presentations and breakout groups were organized according to the five program related chapter titles. Three presentations were made within each chapter topic. They were selected to represent the broadest range of activities on a continuum of approaches to service delivery. As the meeting progressed, it became obvious to the participants that they had more in common with each other than many of them had with the groups with whom they were traditionally more closely identified.

The term "rehabilitation technology service delivery" may indicate more than a semantic shift; it may signify that this emerging field/industry is developing a clearer sense of identity, an expanded view of who and where the players are, and a readiness to look at common issues and overlapping territories.

A Rehabilitation Technology Delivery System

The increased complexity, variety, and potential benefits of technological support demand that we learn to take advantage of methods that will ensure we are getting the most value from available resources. Specialized technology for people with disabilities has been available from prosthetists, orthotists, occupational therapists, physical therapists, speech pathologists, orthopedists, durable medical equipment (DME) suppliers, rehabilitation engineers, rehabilitation technologists, van modifiers and adapted driving specialists, wheelchair repair shops, rehabilitation engineering centers, hospitals, clinics, workshops, special education programs, charitable groups, pharmacies, low-vision clinics, etc. However, technology services may or may not have been provided with the equipment.

The following variables were identified in discussions at the service delivery symposium as being essential components of any comprehensive rehabilitation technology service delivery program:

- Knowledgeably trained, available service providers,
- Consumers who understand the benefits technology offers and know where to find services,
- Professionals who understand the benefits technology offers their clients and who can make appropriate referrals,
- Product availability,
- Availability of technological services,
- Financial resources availability to pay for products and services, and
- Information that links these other components together.

This Guide does presume to cover all these areas, but the broader picture should be kept in mind as you are reading about the business of rehabilitation technology service delivery.

Acknowledgments

RESNA members volunteered their time and made this book a reality. John Leslie, as chair of both RESNA's Ad Hoc Committee on Service Delivery and the Service Delivery Policy Special Interest Group, coordinated the effort. His ability to conduct an invitational symposium with very limited funds makes one believe the man could actually get blood from a turnip! The symposium participants (listed in

the resource section) gave freely of their time and expertise; each wrote a brief overview paper of their program, and then responded to surveys and phone inquiries as the chapters were being written. The chapter writers contributed many hours of their time in writing and rewriting. Their task was made more difficult because everyone recognized that this Guide was a first, and there was no existing model for such a document. Heartfelt appreciation is due all of them. Gratitude also is expressed to Joseph Traub, Project Officer at NIDRR, for his advice and encouragement throughout this project.

INTRODUCTION

John H. Leslie

Why a resource document on rehabilitation technology service delivery? This is a germane and, seemingly, a simple question. However, the answer is rather complex. Rehabilitation engineering/technology has been around for many years. Prosthetists, orthotists, durable medical equipment (DME) suppliers, occupational therapists and others will tell you that they have been delivering it for decades. This is indeed a true statement, but one which is somewhat oversimplified. The rehabilitation engineering movement as a defined body of knowledge in this country probably goes back 15 to 20 years, to the mid-1960s. The Rehabilitation Engineering Centers (RECs), funded initially by the Rehabilitation Services Administration (RSA), then by the National Institute on Handicapped Research (NIHR), and now by the National Institute on Disability and Rehabilitation Research (NIDRR), are the most prominent research manifestation of the profession.

The RECs, however, are funded primarily as research organizations, and according to their federal mandate are expressly prohibited from co-mingling research and service delivery activities. Although fiscally discouraged from providing rehabilitation engineering services, most if not all RECs are involved in service delivery to some extent, as the demand for specialized services has increased. Others provide engineering services in conjunction with their research in a medical environment. This latter activity is consistent with many of the research elements of the medically oriented RECs. While not detracting from research per se, some five to six years ago many prominent people in the rehabilitation field started demanding that the efforts of the established RECs be directed toward developing a service delivery system that would meet the day-to-day needs of persons with disabilities.

Accordingly, over the past few years several important things have occurred to focus attention on rehabilitation engineering/technology service delivery systems. Probably the most important element in this renaissance was RESNA's (Association for the Advancement of Rehabilitation Technology) recognition in 1983 that rehabilitation technology services must be given significant recognition if the profession is to prosper. Accordingly, in 1983, a Special Interest Group (SIG) related to rehabilitation technology service delivery was formed. This entity was born as an Ad Hoc Committee, chaired by John H. Leslie. Subsequently, RESNA established two SIG's, one related to service delivery practice, the other associated with service delivery policy. These have been extremely active over the past several years. They both made significant contributions to recent national legislation specifically outlining rehabilitation engineering as a mandated service in the vocational rehabilitation system.

A second event contributed significantly to an awakening of the need for rehabilitation engineering/technology service delivery systems. NIDRR recognized in 1985 that a natural extension of its support for RECs should be the development of fundamental research in the area of service delivery systems and subsequently encouraging the provision of these services to the persons who need them. Therefore, in 1985, NIDRR funded a project to examine the many facets of effective rehabilitation technology services in this country and Canada. The grant was awarded to the Electronic Industries Foundation (EIF), the lead agency in a consortium that includes: RESNA, the Association for the Advancement of Rehabilitation Technology; United Cerebral Palsy Association (UCPA); Volunteers for Medical Engi-

neering (VME); Cerebral Palsy Research Foundation of Kansas; Children's Hospital at Stanford; National Easter Seal Research Foundation; and the Electronic Industries Foundation. The purpose of this research and demonstration project is to study methods that will facilitate the establishment, growth, and operation of a national network of local and regional rehabilitation engineering/technology service delivery programs, thereby expanding the availability of cost effective, comprehensive rehabilitation technology services.

As part of this project, RESNA was charged with the development of a rehabilitation engineering resource document to assist current practitioners to make their operations more efficient as well as to encourage entrepreneurs thinking of entering the field to "take the plunge." It is this element specifically outlined in the NIDRR proposal that this document addresses. A second task was the development of a publication identifying those persons and/or agencies providing technology services. This directory will be available from RESNA early in 1988, for utilization by persons with disabilities, their advocates, and professionals in the field.

A final event, which may be a serendipitous culmination of the effort, was the recent recognition of rehabilitation engineering as a legitimate, purchasable service by state vocational rehabilitation agencies. The Rehabilitation Amendments of 1986 specifically defines rehabilitation engineering and mandates that services be provided to persons with severe disabilities. The profession has indeed come of age. It is emerging as one of the premiere rehabilitation disciplines in North America. With the advent of the legislation, persons in both RESNA and NIDRR perceived the need for training programs, identification of assistance to service delivery providers, and the integration of research programs to focus on an eventual service delivery outcome. It is to this direction that this document is dedicated.

I would be seriously remiss if I did not acknowledge the significant contributions of the attendees of the Arkansas Symposium held during September 1986. Approximately 30 people wrote papers and gave of their talents and, more importantly, their time, over a weekend to contribute resource material for this publication. They arrived early on Friday and left late on Tuesday. During this time, they contributed an immense amount of valuable information which constitutes the "guts" of this document. It is due to their unselfishness and dedication to the solution of problems confronting severely handicapped people that this book owes its success. It is a debt that shall remain unpaid as far as material remuneration is concerned but will be repaid many times over by the gratitude of handicapped people, their parents, and advocates.

As you read subsequent pages, you will find that this is not an academic exercise but a useful, pragmatic guide. It will assist you to make existing programs more efficient. It will help you enter the field and allow you to provide a broad spectrum of services on a cost-effective basis. Use it for what it is, a resource guide with helpful do's and don'ts which will improve the lives of persons with disabilities. Please understand that the authors are not oracles on all subjects. They have been through the "school of hard knocks" and they may save you from going up the same "primrose paths" they did. Each chapter is written as a discrete unit and can be utilized separately from the others if the reader desires specific information. However, the reader is encouraged to read the document in its entirety, as it represents a significant amount of work designed to provide continuity of information, all of which is extremely useful.

CHAPTER ONE:
MODELS OF SERVICE DELIVERY IN REHABILITATION TECHNOLOGY

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MODELS OF SERVICE DELIVERY IN REHABILITATION TECHNOLOGY

Roger O. Smith

Introduction

The appearance of service delivery in the field of rehabilitation technology can be quite deceptive, like an iceberg. Outwardly, an iceberg presents itself as a short, simple, and finite object. Like an iceberg, the outward appearance of a service delivery model seems to be relatively simple and defined. Also like an iceberg, when one dives a little deeper into the waters to investigate what is below the tip, it becomes quite evident that service delivery in rehabilitation technology is neither simple nor limited. There are many service delivery models, which span a vast area and use a wide spectrum of the methods for delivering technological services. An iceberg can also be dangerous. A ship unaware of the existence of an iceberg may navigate on a collision course, head-on into the side of the iceberg, with dire consequences. Likewise, anyone moving in or around the field of rehabilitation technology faces difficulties if unaware of the different service delivery models in existence. Failing to investigate models thoroughly can be fatal. Any new service delivery program may be a sinking ship if it is ignorant of similar programs and other types of service delivery models being implemented around it.

To assist in understanding service delivery models, this chapter first defines the scope of rehabilitation technology, and then elaborates on different service delivery models. The chapter initially places the service delivery models into the context of the rehabilitation technology field. There are many ways to slice up the pieces of the service delivery pie, and many different ways to classify service delivery models. The following discussion delineates the variables involved in service delivery models. The method of classification ultimately used as the basis of this chapter is a taxonomy based on administrative settings of service delivery programs. There are seven models using this classification in this chapter. Following these descriptions, attributes and limitations of each model are discussed. It becomes clear that each of the seven models provides only a portion of the service delivery in the overall system, and depends on the others to form one comprehensive service delivery matrix. Last, many issues emerge when viewing the attributes and limitations of service delivery models. One issue relates to how these models interact, overlap, and leave gaps between them. Overall, analysis of the service delivery system in rehabilitation technology reveals that there is a set of potential future problems to avoid, issues to further investigate, and adventuresome ideas to implement.

The Context of Service Delivery Models in the Field

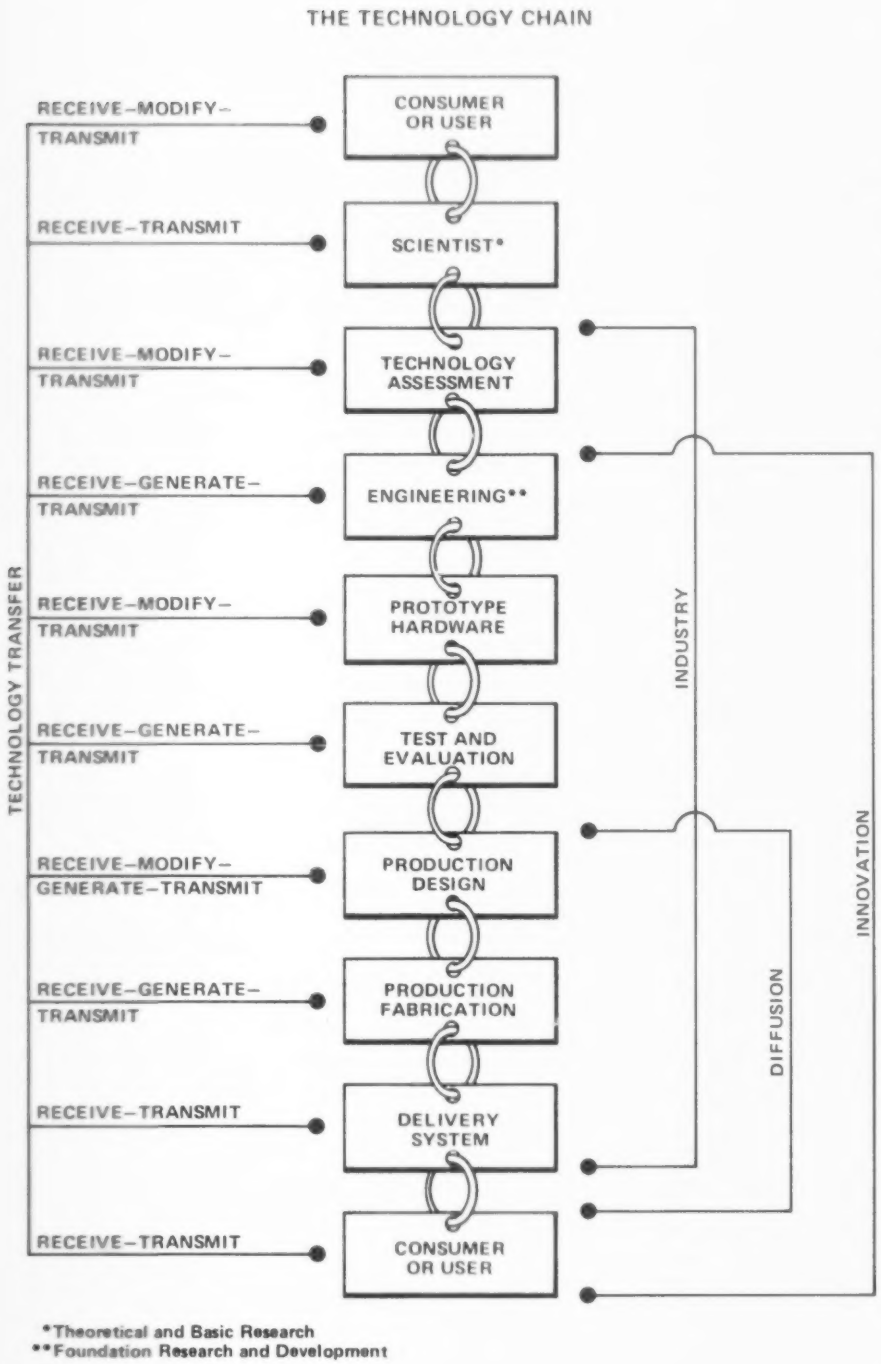
Service delivery is one major function within the field of rehabilitation technology. Actually, it is one of the most significant functions, because providing helpful service is the overall mission of the entire field. In this context, all of the other functions within the field are either overtly or covertly designed to support service delivery. Judy Bernett, in the winter 1987 issue of Rehabilitation Technology Review, proposed a format for describing the field in a chart called "The Technology

Chain." In the spring 1987 issue of that publication, Lawrence Trachtman provided an update of this chain. In both cases, the discussion of service delivery is placed in the context of research, needs assessment, engineering and development, testing and evaluation of new products, fabrication, production, and service delivery. The final link in the chain is the consumer or user. Trachtman's (1987) update to "The Technology Chain" added iterative loops to the overall process. This revision can be seen in Figure 1-1. For the purposes of this text, there are a few more links to the chain that are sensible to include. A significant portion of the rehabilitation technology field is the "education/information/resource" function. This link is becoming increasingly important on an almost day-to-day basis. In the most recent (1986) Rehabilitation Act amendments, there has been renewed emphasis on the training components of the rehabilitation technology field. Training needs fall into both preservice and inservice education programs. In addition, there is a current role and ongoing need for central information centers and resource centers within the various specialty areas in rehabilitation technology. Consequently, education/information/resource must be placed into the overall technology chain. Another link in the chain, and one which requires significant expansion and discussion in this chapter, is the area of implementation, or what Judy Bernett called the delivery system itself. Rehabilitation technologists actively working in service delivery centers are increasingly finding that technology implementation is more complex than was believed. Rodgers (1985), in a detailed analysis of the system, disaggregated service delivery into 19 component functions (see Chapter 7 for list). This list includes the process of acquiring funding for obtaining appropriate technological systems. Even more importantly, many of the more complicated and comprehensive technological systems require a substantial amount of user training. Thus, training the therapists, educators, and family members who work with the technology consumer how to support the consumer in learning and maintaining the system is becoming a critical function within the technology chain. It is possible to summarize the technology chain for the purposes of service delivery modeling in eight different links. These range from basic research (the early end of the technology chain) to reevaluation, monitoring, and revision of technological systems as they are being used by the consumer in the field (at the far end of the technology chain) (see Figure 1-2). As can be seen, education, information and resource is a second dimension within the technology chain, which has a direct impact on the chain as a whole and on each individual link. The technology chain in this format is also portrayed as a full circle, since reevaluation, monitoring, and revisions feeds directly back into basic research. Obviously, any such technology chain diagram simplifies the overall system because it cannot possibly incorporate all of the important relationships between each link and the other links. Generally, however, it can be seen that rehabilitation technology service delivery is a complex system. While service delivery professionals from any one portion of the overall system may feel that service delivery is limited to their specific link or their links, there is interdependency of every functional component. For the purposes of this chapter, service delivery has been defined as those programs that provide rehabilitation technology functions directly to the end user, as highlighted in Figure 1-2.

Classifying Service Delivery Models

Service delivery models can be classified using a variety of descriptive factors. Different primary descriptors result in different sets of service delivery models.

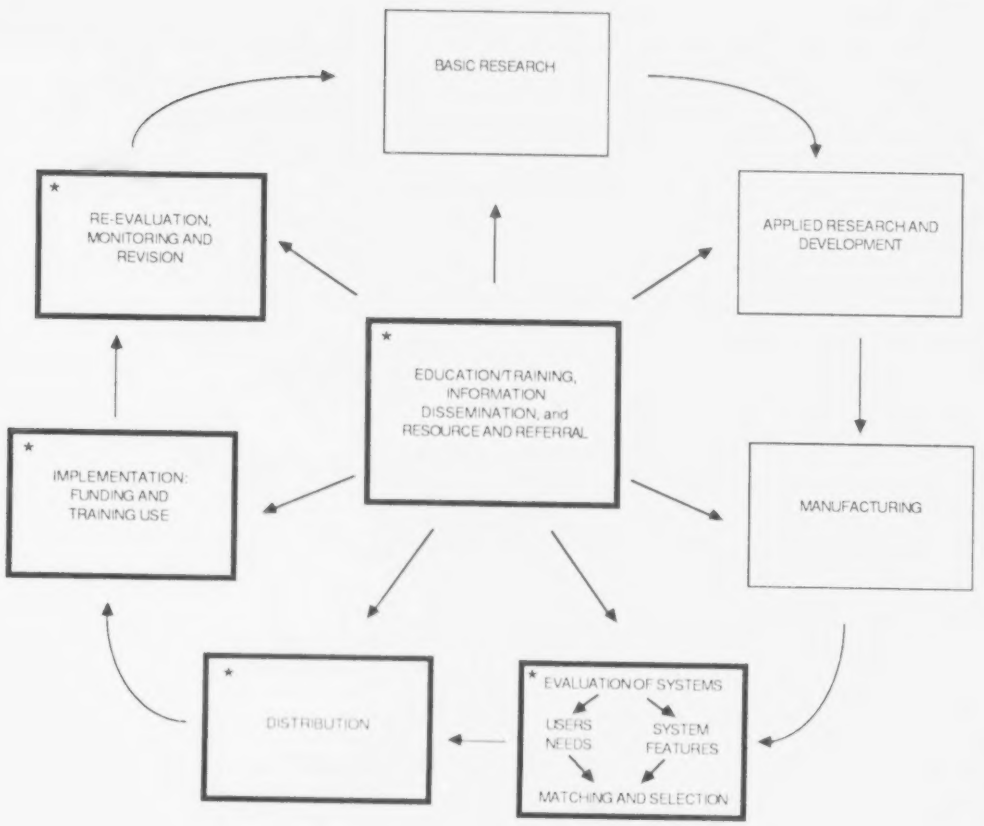
Figure 1-1
(Revised)



*Theoretical and Basic Research
**Foundation Research and Development

FIGURE 1-2

REHABILITATION TECHNOLOGY
ACTIVITY AREAS



* Service delivery components

While the administrative setting is used as the differentiating factor in this chapter, six other considerations are important to review.

The first variable deals with the nature of a service delivery program. The overall **purpose and mission** of a program differs between one service delivery agency and another. For example, some service delivery programs are based primarily as evaluation centers, where clients come from all parts within a fairly substantial geographical region for the purpose of receiving a comprehensive evaluation and recommendations. Ongoing treatment and therapy is not a part of the mission of this type of program. On the other hand, some rehabilitation technology programs are based on a consulting model. The nature of these programs is based on a short-term relationship between the provider and the user. These types of programs may include architectural consultation, mechanical engineering consultation, or industrial and worksite consultation.

The **functional areas** addressed by a rehabilitation technology program provides another way to look at service delivery models. RESNA, the Association for the Advancement of Rehabilitation Technology, for example, has 16 special interest groups. Most of these special interest groups represent one functional service category. Seating and positioning, functional electrical stimulation, and augmentative communication are three examples of functional areas that delineate rehabilitation technology programs, as can be seen in Table 1-1. Many rehabilitation technology service delivery programs focus on a small number of these functional service categories, or are seen as particularly competent in one or two of these categories.

The **geographical catchment area** serves as an obvious delimiter between different types of rehabilitation technology programs. This, perhaps, is one of the more obvious ways of categorizing service delivery programs. For example, some service delivery programs, such as the large, nationwide distributors of equipment, describe their geographic area as nationwide. On the other hand, some outpatient rehabilitation centers which apply a broad range of rehabilitation technology consider themselves more community-based and therefore a local service organization. Between these two would be regional programs such as specialty evaluation clinics.

Another method by which rehabilitation technology programs can be divided is by the **populations** they serve. For example, most prosthetics clinics work with amputees. On the other hand, some of the self-help programs from national disability organizations, such as the Arthritis Foundation or the Muscular Dystrophy Association, focus their technological attentions on the persons with disabilities closest to the population they serve. This division system usually is according to diagnostic category.

Another way of viewing different models of service delivery is based on the differing **internal operations** of programs. For example, some programs describe themselves as interdisciplinary team programs. When clients arrive in their clinic, they can be assured that an interdisciplinary group of professionals will be involved in direct care. On the other hand, service delivery programs may be dependent on one expert, so people attend the program specifically to see or access that particular professional. In another aspect of internal operations, some rehabilitation technology service delivery programs are organized within a corporate structure, while many others are small, privately owned companies.

Service delivery programs also differ in the method by which the program is funded. Some service delivery programs are primarily grant-funded, while some are based on third-party billing. Other rehabilitation technology programs are funded within an organization as a part of the overall organization overhead. These programs remain outside direct cost accounting or direct billing systems.

Table 1-1:

Special Interest Groups of
RESNA, the Association
for the Advancement of Rehabilitation Technology

SIG-1: Service Delivery Practice

SIG-2: Personal Transportation

SIG-3: Augmentative and Alternative Communication

SIG-4: Prosthetics and Orthotics

SIG-5: Quantitative Assessment

SIG-6: Service Delivery Policy

SIG-7: Technology Transfer

SIG-8: Sensory Aids

SIG-9: Wheeled Mobility and Seating

SIG-10: Electrical Stimulation

SIG-11: Computer Applications

SIG-12: Rural Rehabilitation

SIG-13: Robotics

SIG-14: Biomechanics

SIG-15: Information/Networking

SIG-16: Gerontology

Yet another way in which service delivery programs differ is by **the location where service is offered**. For example, some programs deliver services via van or truck to local communities. Other programs have satellite community centers from a central home base. Yet other programs limit their outreach by maintaining only a regional center to which all persons must come for service.

Finally, the **administrative home base** of service delivery programs provides a classification scheme. This is the taxonomy used for the following models.

The Seven Models of Service Delivery in Rehabilitation Technology

Model 1: The Durable Medical Equipment (DME) Supplier

Depending upon who is asked, the DME supplier may be seen as either one of the many types of rehabilitation technology service delivery programs or may be considered as a retailer outside of the service delivery program purview. This disparity usually occurs due to the clinical bias of many of those working in rehabilitation technology. The increasing reality of rehabilitation technology, however, as more and more individuals move into private entrepreneurship, is that the DME supplier is a significant model within the overall rehabilitation technology service delivery assembly. The DME supplier has acquired its name primarily from the historical fact that Medicare and Medicaid coined the term 20 years ago. Medicare delineates certain types of equipment as "durable medical equipment." These items are considered reimbursable. Other equipment, however, regardless of the benefit to an individual, is not reimbursable by Medicare. This "DME" terminology has withstood the test of time over the last 20 years or so, and those companies which historically supplied wheelchairs, walkers, and bathroom commodes and other medical-related equipment to patients in their homes have retained that name even though the technology and services they provide have greatly expanded over time. The industry has recently begun to refer to itself as HME (home medical equipment) to reflect the rapid growth in the types of technology and services it provides.

Moreover, the nature of the DME supplier has changed over time. Once, the DME supplier might have been the local Walgreen's or Rexall Drugs. In the back of the store someplace, they would have sold or rented some relatively unsophisticated types of equipment, for example, canes, walkers, portable commodes, trapeze bars, etc. As home care evolved, and with the move toward deinstitutionalization and maintenance of individuals within their homes and community environments, the need emerged for a substantial amount of equipment to be available for individuals and their families. This phenomenon coincided with enormous strides in the technology that made a new universe of more sophisticated equipment possible in the home setting. Consequently, the need arose for enterprises where people could acquire fairly large and expensive medical support types of supplies and devices. Even then, however, the DME supplier may not have been considered a significant part of the rehabilitation technology service delivery system.

In more recent years, the role of the DME supplier has evolved to include a different level of service. DME suppliers continue to provide mobility devices and other types of medical appliances, supplies and equipment, and in addition they have taken on the role of learning more about what types of medical and rehabilitation devices and equipment are available on the market, obtaining equipment and devices as they are individually needed by clinicians and consumers, and becoming familiar with the advantages and disadvantages of much of the equipment that they sell and distribute. Consequently, the DME supplier in many regions and locations has come to be the significant agency for helping consumers select the most appropriate tech-

nology and for teaching them how to apply that technology within homes and communities.

In terms of the features of the DME supplier model of service delivery, the purpose and mission of most of these agencies is as a business. Therefore, while most provide some level of uncompensated care, their general orientation is the profit model. Their functional service categories historically tended to rely on equipment that is already manufactured, marketed, and available (e.g, standard seating and positioning devices, some types of electrical stimulation devices such as transcutaneous nerve stimulation [TNS] and functional electrical stimulation [FES] units, and self-care devices such as button hooks, extended reachers, and nonskid mats). More recently, however, customized equipment and systems, designed for and fitted to a given patient, have become an area of rapid growth.

Durable medical equipment suppliers generally fall into one of three categories, depending on their geographic catchment area. The largest group tends to be relatively small, family owned operations serving a relatively limited geographic area through a limited number of company sites. In addition, there are a smaller number of so-called regional operations serving a whole state or even a number of states. Finally, there are a few "national" companies operating a hundred or more sites across the nation. A more recent phenomenon is the practice of historically different types of health providers (e.g., hospitals) developing their own DME capacity. They may initiate their own operation, but more likely they enter into a joint venture or contract with an already existing DME company.

Model 2: The Department Within a Comprehensive Rehabilitation Program

Many service delivery programs are housed as a component of a comprehensive rehabilitation program. These comprehensive rehabilitation programs may or may not be based within a hospital setting, but the primary feature of the setting is that the mother agency provides a comprehensive rehabilitation service that is multidisciplinary. Thus, the purpose and mission of these types of service programs usually is to support the comprehensive rehabilitation program. The overall mission is complete rehabilitation, where technology serves as one of the components to help a person move toward that goal. The functional service categories addressed by service delivery models within these settings are comprehensive as well. The rehabilitation technology applied in this model is usually fairly comprehensive in that it looks at most of the functional deficit areas. The geography served by technology service delivery programs within these comprehensive centers tends to be either community/local-based or within regional programs, although some programs exist with wider catchment areas. Spinal cord injuries, stroke, head injury, amputees, cerebral palsy, and multiple sclerosis are examples of typical populations. The internal operations of these technology delivery systems are fairly consistent. Most include rehabilitation technologists as part of a larger rehabilitation team, and function on a multidisciplinary or interdisciplinary day-to-day operating basis. These technology departments usually are economically responsible to the rehabilitation center, which itself may be a component of a larger medical organization. The funding of service delivery technology in this model is usually oriented to third-party billing on a cost basis.

Model 3: The Technology Service Delivery Center in a University

A substantial number of service delivery programs in technology are based within a university system. Consequently, the overall purpose and mission of these types of centers incorporate a large component of research and have a staff com-

posed of not only clinical but also more highly technical engineering personnel. Very few of these centers, however, are heavily staffed with business- and marketing-oriented individuals who might be found in some of the other models.

Most of the rehabilitation engineering centers (RECs) fall within this type of model. RECs not only provide some service delivery through affiliated clinical programs, but these centers usually take on a significant responsibility of disseminating current research and development information through professional conferences and professional literature. The functional service categories addressed by service delivery centers within universities tend to be more limiting and less comprehensive than some of the other types of models. This is primarily due to the research emphasis of these centers. RECs, for example, are very specific in terms of service delivery areas.

Geographically, these university-based, research-oriented centers are organized to address a nationwide need. The affiliated clinics and service delivery programs within these centers, however, have more of a regional orientation. Likewise, the populations that these service delivery programs serve tend to be more focal in the functional limitation they address, due to their research interests. The internal operations of programs in this service delivery model are usually connected very closely with the research operations of the university for management. Thus, the clinical members in this service delivery model usually have joint appointments with other departments and organizations. The team aspects of programs within this model are highly dependent on the type of functional service categories they serve. Funding of programs within this model usually has a significant portion of affiliated revenues based on grant and contract funds, although programs that are also affiliated with hospitals additionally have a core funding base around third-party reimbursement.

Model 4: The State Agency-Based Program

Rehabilitation technology service delivery is often a concern of state governments and delivery departments within them. Examples of state agency-based programs are programs through their departments of Public Instruction, Vocational Rehabilitation Departments, Blind Commissions, etc. The purpose and mission of services organized by state agencies is to provide an organized, statewide delivery system serving both metropolitan and rural areas. Overall, the functional service categories of programs tend to be diverse, but due to legislative mandate are focal to populations within the purview of each state department. The internal operations of these types of delivery programs are extremely varied because some of the programs are administered on a centralized, statewide basis, while others are implemented more locally by field-level personnel. Funding in most of the cases of service delivery in this model is administered through the state. Some of these funds are earmarked federal funds, such as special education monies related to The Education of the Handicapped Act (Public Law 94-142, as amended), or state-matched federal funds for vocational rehabilitation programs.

Model 5: The Private Rehabilitation Engineering/Technology Firm

The orientation of the services being provided by programs within this model is typically entrepreneurially based. Some of them continue to be family run businesses, and there are a growing number of individuals starting consulting companies within this model. This type of program generally operates fiscally as a for profit small business, using standard small business principles and practices. The functional service categories seen by programs within this model vary across the spectrum of rehabilitation services and disabilities. Van modification shops, many of the orthotic and prosthetic companies, independent rehabilitation engineers, and therapists in

private practice are included in this category. Geographically, these private rehabilitation/technology firms usually focus locally and regionally in terms of marketing. The populations served by programs in this model usually fall within disabilities closest to the professional background and experience of the owners of the firm. Thus, if a physical therapist is one of the key persons within the firm, the disabilities tend to be related to mobility orientation, including spinal cord injuries and neck and back pain injuries. On the other hand, if a speech and language pathologist is one of the key individuals in the firm, the patient population would tend to take more of a communication disability orientation, such as including cerebral palsy or stroke. Private rehabilitation/technology firms are highly sensitive to fluctuating referrals and contracts that may flow in and out of the organization. The funding basis in most of these programs is third-party billing. Setting up contracts with other institutions to provide some facet of rehabilitation technology service delivery, however, is becoming more common.

Model 6: The Local Affiliate of a National Nonprofit Disability Organization

Significant rehabilitation technology service is provided out of the national nonprofit disability oriented organizations, such as the National Easter Seal Society, Muscular Dystrophy Association, United Cerebral Palsy Organizations, Association for Retarded Citizens, American Foundation for the Blind, American Heart Association, Arthritis Foundation, etc. Programs based out of these types of organizations have a primary purpose and mission founded on helping individuals with disabilities. Both the functional service categories and the populations served tend to be relatively specific to the disability organization itself. Most organizations desire to support programs that address the disabilities for whom the organization was originally founded. The geography served by programs out of national nonprofit disability organizations depends substantially on the local chapters and regional organizations. The strengths of these local chapters sets the underlying foundation for the success of the rehabilitation technology service delivery. Virtually all of the specific service delivery programs are administered and funded on a local level, although many tap into national resources for management ideas, program development plans, etc. The geography on an overall basis may be national, but the actual application of specific programs is usually relatively local or regional. The internal operations of national nonprofit disability organizations' service delivery programs vary from locale to locale. Typically, however, an umbrella national organization coordinates smaller affiliates and chapters. These chapters may provide rehabilitation technology on an individual consultant basis, or may have an entire evaluation team with loan equipment available. Funding to the national nonprofit disability organizations is rather unique. Perhaps it is programs in this model that utilize the widest potpourri of funding. Programs within this model are constantly looking at grants and contracts, but most significant in terms of a unique characteristic is their skill in soliciting funds through donation and special fund raising events.

Model 7: Miscellaneous Types of Programs, Including Volunteer Groups and Information/Resource Centers

There are other types of service delivery programs which do not fall under the typical descriptions of the six models described above. One of the most significant of the miscellaneous models is the services provided by volunteer groups. In the United States, these groups have tended to develop from within private industry, e.g., the Telephone Pioneers of America are a service association of veteran telephone company employees, and the Volunteers for Medical Engineering (VME) formed

from a core group of Westinghouse engineers. Groups like the Rehabilitation Engineering Volunteer (REV) Network, which has strong support from Bell Labs, have also had leadership from the rehabilitation technology service delivery field. In these types of programs, the primary purpose and mission of the group is altruistic, to be of service. In some cases, there is a fair amount of corporate support, not only ideologically but also monetarily, to facilitate the service being provided. Geographically, these volunteer organizations tend to be somewhat local or regional, where these groups of individuals can congregate to discuss plans and coordinate from one project to the next. Conceptually, however, they usually do not limit their geographic scope. The functional service categories and populations served are highly dependent on what type of expertise the volunteer organizations bring together. Volunteers are also used creatively within some of the other models. At the Courage Center in Minneapolis, volunteers do most of the actual device fabrication, under the supervision of rehabilitation technology service delivery personnel. The Rehabilitation Institute in Pittsburgh coordinates a volunteer group which develops custom solutions for individuals.

The most successful approaches tend to be the ones where there is close liaison between rehabilitation technology service delivery personnel and volunteers, as there is in the REMAP volunteer system in England. Without this type of linkage, the well intended volunteer tends to "reinvent the wheel," and either over- or underdesign a solution.

Other types of miscellaneous service delivery programs which have some very close ties to some of the more traditional service delivery models are the information dissemination, resource, and referral agencies. Although providing information is not as directly and clearly related to service delivery, virtually all service delivery in the rapidly advancing and updating field of rehabilitation technology is dependent on very quick and accurate access to information resource centers. In many instances, a consumer may need no more than accurate, current product information in order to solve their technology-related problem. Thus, information dissemination and resource programs fall within the miscellaneous model of service delivery. These programs are usually regional or national in geographic scope. Some of these centers have a specific technology expertise, such as sensory aids or assistive listening devices; others target a specific age group, such as children; others are categorically specific, such as education, employment, or recreation. Funding is usually through grant or larger institution sponsorship, although some try to recoup part of their operating expenses through minimal charges for the services rendered.

Attributes and Limitations of Service Delivery Models

Each service delivery model has its own character and personality. With each emerges a set of attributes and limitations. It is clear that there is a role for each model, and probably for many more, in the delivery of rehabilitation technology service. The advantages and disadvantages related to each, however, provide some suggestion as to which model is preferable in given situations and within various environments. Some of these attributes and limitations are discussed here.

The function of the DME suppliers is integral to overall service delivery in rehabilitation technology. Without a method of moving products from the manufacturers to the consumers, no service delivery would be possible. DME suppliers are in a unique position. They have direct access to information about products from manufacturers as well as personal interaction with consumers. This permits DME suppliers the opportunity to educate consumers and potential users about both new products and the more tried-and-true technology. Unfortunately, there are some

potential limitations of the DME model. One is that DME suppliers frequently have excellent business skills, but do not inherently bring to their job a background in clinical rehabilitation technology service delivery. Additionally, many DME suppliers may not have ready access to a range of clinical evaluation personnel, so that decisions in terms of technology selection and application may lack the benefit of a broader professional rehabilitation perspective. While a large proportion of rehabilitation products do not require extensive clinical rehabilitation skills for appropriate application, those that do will pose problems for the traditional DME model. Some DME suppliers are developing expertise in both clinical evaluation and in customization of products, but this is not as yet the norm.

Funding issues will also arise in any of the models that are organized as for profit businesses, notably the DME supplier and the private rehabilitation firms. Services or products provided are likely to be based on the availability of monetary reimbursement, no matter how desperately the consumer needs the service or product. Although most companies can and do write off a certain amount, if they continue the practice extensively a few individuals may get needed equipment for free, but in a very short time no one will get any equipment because the company will no longer be in business.

Comprehensive rehabilitation programs which include a rehabilitation technology component have a different set of attributes and limitations. One of the major attributes of rehabilitation technology in this type of setting is that rehabilitation technologists are usually part of a comprehensive rehabilitation team. Thus, when necessary, the selection of technology can be based on a thorough evaluation from all of the rehabilitation perspectives. In this way, it is easier for the rehabilitation technology to be successful because it has been carefully examined from many different clinical perspectives and is viewed from the overall rehabilitation process. Rehabilitation technology applied from within a comprehensive rehabilitation program, however, has its problems. One is that, although these types of settings sincerely attempt to involve the consumer/patient in much of the decision making in rehabilitation, the medical model has not been conducive for providing the consumer with a major decision-making role. Bottom-line decisions in day-to-day activities, therapy, and medication prescriptions are usually ordered or coached by a rehabilitation physician or other professional. Additionally, because of the very wide spectrum in which comprehensive rehabilitation programs are oriented, technologists cannot usually become specialists in all areas of technology. Technologists in many of these programs tend to be more generalist, without the current research, product information, and latest techniques in every aspect of rehabilitation technology. They are more dependent on consulting with the specialists in these areas. Departments within comprehensive rehabilitation programs also need to be extremely fiscally conscious. Service is rarely provided on a needs basis. Rather, the monetary bottom line carries the primary weight in the provision of rehabilitation technology services. Finally, comprehensive rehabilitation programs have traditionally been oriented to inpatient settings, and have aimed their intervention to times in persons' lives where intensive rehabilitation is required. Consequently, some do not retain the flexibility to providing ongoing community-oriented support which might not require the resources of a full rehabilitation team.

Centers based in universities encounter another set of attributes and limitations. One of the most overt attributes is that most of these centers are integrally tied into research and training activities. Therefore, the service delivery programs have extremely current information in the specific research area in which they are affiliated. On the other hand, because research tends to be focused, technology service delivery centers based in universities are sometimes limited in their approach to spe-

cific functional areas, and fail to take on a comprehensive rehabilitation approach. Academicians and researchers also sometimes discover that they are less clinically based due to the academic pressures which forcefully encourage research publications and teaching activities. For these individuals, remaining abreast and comfortable within the clinical domain is somewhat difficult. Also, sometimes service centers in universities find it difficult to remain sufficiently consumer oriented. This is certainly paradoxical, given that research provides a basis for ongoing technology innovation. Researchers and academicians may find themselves the most distanced from the end users of the technology. An attribute which is observed on occasion within university settings is that grant funds and student support, in the form of research and project assistants and practice students, sometimes enable service which can be provided at minimal expense. This can be a significant advantage for the consumers who are able to access the system.

State agency-based programs find themselves in an enviable position with many attributes. Some limitations, however, offset the absolute effectiveness of the programs. State agencies are well known for the bureaucracies and multiple levels of paperwork. Therefore, the initiation of any new program is highly dependent on a long time frame and implementation phase. Some state agencies are under constant scrutiny by the legislative branch of the government, which can at any moment change priorities or delay the implementation of ideas. Other limitations of state agency-based programs are obvious geographic restriction. Providing services for others outside of the state is basically unknown. Some state agencies also have some difficulty in coordinating with other state agencies within their own state. Because each has its own legislatively mandated priority, which restricts the population that it serves and limits its own earmarked budgets, coordinating efforts can be a difficult process. Ironically, some of the strongest attributes of the state agency programs are the same as the limitations. For example, although state programs are restricted to a given geography, they also are usually required to provide services which apply to the entire state. Also, because the state agency falls under the umbrella of the state organization, it sometimes provides avenues to communicate effectively with other state agencies and to coordinate services in an efficient manner. Perhaps one of the strongest attributes of state agency based programs is that they usually base their provision of services on how much the consumer needs the service as opposed to whether the consumer has the funds available to pay for the service. This too has a downside. If an agency such as Vocational Rehabilitation or Special Education remains the primary source for technology services, disabled individuals who have lifelong technology needs may have no place to go for their technology services when they are no longer agency clients. With the increasing availability of community-based, private-sector technology services, it may be counterproductive in the long run for government agencies to continue to develop in-house services that would impede the development of private sector initiatives, either in for-profit or not-for-profit organizations.

The private rehabilitation, entrepreneurial firm is perhaps one of the oldest and the newest service delivery models in the arena of rehabilitation technology. Private rehabilitation firms have the flexibility of a small business to innovatively and rapidly move into areas of special need. In a field such as rehabilitation technology, this is a significant advantage, as the products and techniques available are constantly changing and improving. Another attribute of the private rehabilitation technology firm is that these agencies, in particular some of the private consulting companies, are usually created and run by exceptional individuals in the field. They tend to be individuals who have gained a substantial amount of expertise in a specialty area, and thus are seen as a significant resource in their area of rehabilitation

technology. Unfortunately, as with all of the other models in rehabilitation technology service delivery, there are some limitations to the private rehabilitation technology model. The smaller agencies tend to be based on the strength of one or two individuals, and may not be very team oriented. They coordinate and collaborate with other agencies in somewhat of a team fashion, but frequently do not provide a full interdisciplinary evaluation and implementation of rehabilitation technology. In many application situations, this is not a problem, but this is highly dependent on the type of client and the particular area of rehabilitation technology.

National nonprofit organizations are unique and have a significant strength in the basic consumer orientation of the organizations. Many of these organizations are based on a wide membership which includes users, consumers, parents of users, as well as clinicians, technologists, and other professionals. In the area of funding, one of the major attributes of the national nonprofit organization is its skill in acquiring funds through innovative campaigns. On the other hand, the nature of funding in a national nonprofit organization is constantly being placed under stress, in an unknown financial environment. Another limitation of the national nonprofit organization is that its local chapters are frequently not closely tied into some of the research, development, and information bases in the region. Consequently, they provide some of the best service available, but without the most current information available in the area. A last limitation of the national nonprofit model is that most of the organizations limit their services to specific disabilities or diagnostic classifications. This in itself is not bad. However, it once again emphasizes the need to coordinate service delivery between organizations.

The miscellaneous categories of service delivery models are not excluded from having particular attributes and limitations of service delivery. Generally, one of the limitations of the miscellaneous models, such as volunteer agencies, falls under the category of the security of the funding base. Because they are not seen as a viable, self-supporting type of model, they frequently do not have a financial foundation for ongoing support. Another limitation is that frequently these miscellaneous types of models, particularly the volunteer model, are dependent on the enthusiasm of an individual or a set of individuals, without a long-term organization or system. Therefore, frequently in these models service delivery is a string of short projects which may not be carefully tied or organized in a long-term direction. It is also very easy for some of the projects within these miscellaneous types of service delivery programs to duplicate efforts already made in other areas of rehabilitation technology. Information does not always flow from other research, development, and service delivery centers to these models. The volunteer model also has the danger of failing to provide continuity of service. For example, frequently the ongoing maintenance of an engineering product falls by the wayside after a volunteer has performed the initial design. On the attribute side, some significant services have been provided by the volunteer, information dissemination, and other service delivery models. Because these miscellaneous models are basically supported by the enthusiasm and the excitement of individuals, some of the service delivery results are extremely practical solutions, innovative ideas, and highly needs-oriented projects.

General Issues Arising from the Service Delivery Matrix

Several general issues emerge pertaining to service delivery models, their attributes and limitations. These issues are significant in their complexities and the implications on service delivery in rehabilitation technology. Many of these require substantial discussion, and consequently will not be elaborated in this chapter. These include the dangers of applying rehabilitation therapies in exclusion of technological

adaptation and vice versa, and the lack of coordination between preservice educational programs, inservice programs, resource centers, and manufacturers with service delivery programs. Two issues most directly relevant to models of service delivery, however, are 1) the danger of failing to integrate services; and 2) questions related to quality assurance.

Integration of Services

The need for integrating services is critical. As has been clearly depicted throughout the discussion of service delivery models, every model is limited in its scope. The solution to a fragmented service delivery system is to integrate parts to provide continuity and comprehensive programming.

The concept of vertical integration in medical care is applicable in this discussion. When acute care hospitals discovered that vertically integrating their services was a prudent administrative philosophy in the new health care financing situation, they began expanding their health care activities to include home health care companies, nursing homes, outpatient services, and even family physician programs. The result of these vertically integrated systems is that an individual patient or client who used to move in and out of one program and into another can now receive a full range of benefits from one organization and easily move between the various levels of services. Besides providing some economic viability for the acute care hospitals, this has had the additional benefit of preventing many of the acute care hospital consumers from "falling through the cracks" between agencies, bureaucracies, or service delivery programs that are inherently limited in scope.

The limited scope of rehabilitation technology service delivery models suggests that the integration of services will need to occur on three different levels. The first is across geographic regions. This aspect of needing integrated services has been well acknowledged by the service delivery providers. It remains a problem, however, that regional rehabilitation centers providing rehabilitation technology have been virtually the only way many geographic areas have access to technology application experts. There are simply insufficient numbers of rehabilitation technologists within local facilities and communities to provide services.

The second need for integrating services is across the longevity of the individuals as they grow and mature. In the current rehabilitation technology service delivery system, there is a phenomenon that can be termed "the transitional dump." This transitional dump is the example of the need to vertically integrate services across years. For example, until recently, little attention had been given to what happens to individuals within the school systems receiving technology services who then reach the age at which they will graduate and move into the vocational domain. If they are using technology applications which belong to the school system, they cannot carry this into any vocational pursuits. The technology personnel that have been working with these students also terminate their services upon the students' graduation. Enders (1987) has aptly pointed out the significance of this vertical integration deficit.

A last area requiring the integration of services is across different areas of function. Historically, the medical and educational systems have not coordinated well, even though each has tolerated the existence of the other without any questions. The field of rehabilitation technology is particularly affected by the split of these two systems, because rehabilitation technology needs to be introduced in both service delivery systems and applied across each. Many funding questions have emerged; for example, whether a given rehabilitation technology system should be paid for by a medical funding agency or whether the educational system is responsible for pur-

chasing the system. Without a method for integrating services of major functional activities, problems such as this funding issue will not resolve.

Quality Assurance

In reviewing the different service delivery models and the individuals who implement the different functions within rehabilitation technology service delivery, it becomes apparent that a variety of skills and educational backgrounds are required for the adequate provision of services. The skills and experiences necessary are dependent on the type of service delivery model. Thus, if quality assurance is to be implemented, any strategy must incorporate different requirements for different service delivery situations.

There may exist a set of functions that rehabilitation technologists perform that could be documented and be used as a basis for quality assurance. These areas of function range from designers, to fabricators, to researchers, to manufacturers, to distributors, to evaluators, to fitters, to trainers, to monitors, to funding, to acquisition individuals, etc. To increase the complexity of assuring any type of minimum quality within rehabilitation technology service delivery, very little research has empirically documented the criteria that are necessary for adequate service delivery. For example, it is as yet unknown what components are necessary in the functional evaluation of an individual, and what the best strategies are to evaluate the technology in order to match the features of a technology system to the particular needs of an individual. Another example of an area with unknown service delivery criteria is the best composition of a team. It has yet to be determined when a team should be utilized and in what service delivery situations an individual expert is adequate. Some attempts have begun in the process of examining the criteria needed for certification, which highlight the multidimensional complexity of the process (Smith, 1987).

Basically, it can easily be seen that any type of quality assurance program can be very complex. A competent program requires a set of necessary skills, achieves necessary outcomes, and uses appropriate methods and resources.

Development of certification of individuals and programs in rehabilitation technology will require an involved analysis and planning process. It is sufficient to state here that review of the various models of service delivery reinforce the idea that the need is current.

Implications and Summary

Scrutinizing the seven service delivery models in rehabilitation technology reveals the contributions each makes to the field. The absence of any one of the service delivery models would substantially hamper the ability of total service delivery in rehabilitation technology. Delineating these models has highlighted their unique and inherent attributes and limitations. This in turn has pointed out a number of service delivery issues. Basically, the seven models are vitally interdependent, but their interaction is not always optimal. It is hoped that as the field continues to mature, resolution of these issues will occur. In this way, the most successful overall service delivery matrix in rehabilitation technology can be realized. While service delivery models are not as simple as they first appear, understanding their structure, features, and their relationships in the overall service delivery matrix can facilitate the successful implementation of the models. With this knowledge, service delivery programs can continually and safely navigate through the field of "icebergs."

Acknowledgments

The author would like to acknowledge the contributions to this chapter made by the 22 exemplary technology service delivery programs who completed surveys on their models of service delivery.

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CHAPTER TWO:
MARKETING

Phil Mundy

Introduction

In June 1987, Rick Hanson completed a two-year-long journey around the world in a wheelchair, raising money for spinal chord research. As Rick neared the completion of his trip, travelling across the Canadian Prairies, Rocky Mountains, and finally rolling into Vancouver, his story appeared in every TV newscast, newspaper, and magazine in the country. Rick sent a message around the world, making people aware that disabled "physically challenged" people have much to offer.

As Rick Hanson demonstrated that great things can be accomplished by disabled individuals, rehabilitation service providers must market their services effectively if they are to survive and grow. A well-organized service provider meeting the needs of disabled individuals is an asset to the community, and the community must be made aware of that fact. Doing the job well requires marketing.

According to Irene Sanders (1987), marketing is a function that goes far beyond sales and advertising. "Marketing is a process of learning who your customers are and what they need and want from your organization (research); using that information to make policy, service and programmatic decisions (planning); implementing new policies, services or programs and asking for feedback (testing); and letting your customers know that you have responded to their needs and concerns (communication). Customer satisfaction is the ultimate goal of a marketing program."

What is marketing? Marketing includes all activities involved in directing the flow of products and services from the producer to the consumer. Whether a private company or a public, not-for-profit organization, the service provider must have a philosophy that focuses on developing the product or service around needs of consumers.

Rehabilitation engineering centers ought to be interested in marketing for many reasons. First and foremost, a good rehabilitation service provider works to identify important needs of disabled people in the community. When needs are identified, appropriate training programs, technical aids and devices, and service delivery mechanisms can be developed to efficiently provide solutions. This is marketing. Undoubtedly it is something most rehabilitation service providers try to do every day.

Marketing is vital to the success of an organization. For most public facilities, a consistent effort must be maintained to keep funds coming in to support operations. A manufacturer providing a product has to keep the company's goods and services visible to the consumer. Where other service providers are involved, companies spend large portions of their operating budgets to stay ahead of the competition.

In developing a marketing plan, a supplier of goods and services is making an effort to work more effectively. The process involves looking at what is being supplied now and considering where this current supply falls short of meeting needs of the population. A plan is then formulated so that the service provider can efficiently address needs with well-designed products and services.

Management and the Organization

Identifying Marketing Objectives

Objectives are the cornerstone of any plan. In identifying marketing objectives, management and the organization are pinpointing the critical information needed in formulating strategy, setting priorities, budgeting, and hiring staff. While marketing strategy is developed and refined as the operation grows, marketing objectives must be carefully considered and should remain relatively stable in time. Additional discussion on program focus can be found in Chapter Three of this document, Program Development and Implementation.

It is imperative that objectives be defined so that the players have specific goals. To encourage measurable success, objectives ought to be quantitative. Typical statements found in an organization's marketing objectives might include the following;

- We will provide improved access to mobility for nonambulatory children residing in our state.
- We will provide a comprehensive job-readiness training program for individuals over 18 years of age requiring assistance in our community.
- We will provide improved access to augmentative communications programming for individuals receiving treatment within this facility.

These statements indicate who the target group of customers are and clearly identify boundaries intended to focus the operation's efforts. If more detail is known about the target market that can assist in quantifying what needs are to be filled, they might also be stated in the marketing objectives. However, objectives are more often broadly stated to allow the management team as much freedom as possible in plotting strategy and pursuing more business within the framework of the objectives.

Manpower and Structure

A strong commitment in manpower and other resources is required to realize marketing objectives. The marketing plan, with the elements of strategy, products, promotion and sales, takes time to mature. With initial goal setting, the process of planning, implementing, assessing performance, and adjusting the plan is an ongoing activity. To be successful, these activities must occur constantly within the organization.

A concern expressed by many rehabilitation service providers is the general lack of qualified staff with formal training in marketing. This shortage of qualified manpower is not unusual in many small businesses. It should not deter the organization from developing a marketing plan. Every organization markets a product or service; the choice is to decide to take control of the marketing component of the business or to let customers be exposed to a random, unplanned image of what you are attempting to do.

Figure 2-1 illustrates the necessary components in planning for marketing and a system of controlling what takes place.

The most important thing when deciding to formalize a marketing program is to get started. Most small companies begin by learning what they can from others working in similar fields. Plans are formulated, tried, and redirected toward goals. Training seminars and short courses are available where individuals can acquire useful skills. A wide assortment of consultants and experts are eager to provide assistance to the novice marketing strategist. In obtaining outside assistance, pinpoint what you want and shop carefully when choosing a consultant. Remember that this

person or persons will be representing you and your rehabilitation service delivery program while in your employ.

To facilitate the entrenchment of marketing as an important component of a rehabilitation service delivery program, it must be integrated into the structure of the organization. In small and large businesses, structure is needed to keep good people working effectively and in harmony together. Marketing often fits into organizational structure as shown in Figure 2-2.

While the above organizational structure may look like a lot of people, in many companies the same person does several jobs depending on the requirements of the business.

Needs Analysis Market Study

Market Size and Trends

To determine the future habits, needs, and expectations of any segment of a population can be difficult. However, the effort expended in researching need before beginning to supply a product is well spent.

The most widely used means of obtaining data about any large population is to review existing government statistics relating to the group in question. Unfortunately, due to several factors, direct statistical data relating to disability are not readily available. However, statistics that are accessible through government sources are useful, provided that the investigator is prepared to make assumptions and watch carefully for double counting of individuals in overlapping groups.

A time consuming but considerably more accurate approach to the problem of establishing potential market size involves sampling the population using a survey. Aside from tabulated results, the process of planning and conducting the survey is likely to provide much useful information.

The following example demonstrates this point:

> In 1982, Canadian Posture And Seating Centre, an organization interested in supplying specialized seating and positioning devices, conducted a survey to discover the perceived need for specialized seating for disabled persons in Ontario. In preparing the survey, the researchers contacted and discussed possible survey questions with many users of rehabilitation equipment. These early contacts provided much useful information about potential clients, the funding of such devices, referral and assessment models, etc.
>
> A mailing list was prepared which included many rehabilitation centers, long-term care facilities, schools for disabled persons, and other potential customers. This mailing list was used in conducting the survey and was also an excellent vehicle for better direct mail advertising when production operations began later.
>
> When the surveys were returned, responses revealed two client groups, each with different levels of awareness of seating needs and product availability. Facilities servicing children were aware of the need for special seating. Most importantly, the responses had a direct impact on products the company developed for children. Respondents expressed interest in purchasing the organization's products when available. Many facilities serving adults were not only unaware of the need for special seating but did not understand the questionnaire.
>
> The supplier of special seating then used these results to plan a marketing strategy. The organization subsequently began supplying equipment for chil-

Figure 2-1
Market Planning and Control System

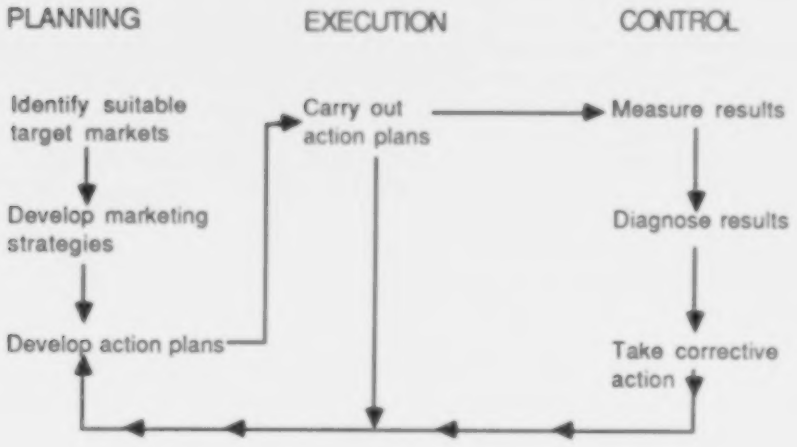

Figure 2-2
Marketing Structure

dren and also launched an education program directed at adult centers, prior to targeting sales of adult equipment.

In this example, the market study provided much more information than was anticipated by the research team. Every facet of the business was affected, including product design, materials used in fabrication, cost expectations, delivery mechanisms, and clinical staffing requirements.

To begin the process of assessing the market size and needs for the target area, the following questions will be of interest:

- What are the constraints imposed by the environment on the rehabilitation engineering service provider?
  Many service providers are limited to supplying services to either children or adults, inpatients only, individuals qualifying for specific benefits only, etc. Before beginning to plan any service delivery program, it is imperative that these parameters be understood by all concerned.
- How big geographically is the region into which products and services will be provided? While most people would like to say they serve coast-to-coast or worldwide, for the purposes of focusing efforts and measuring performance, it is best to be realistic. Select an area compatible with the financial and human resources available.
- How many people live in the target area who might benefit from the kind of services to be provided? What disabilities have a higher than normal incidence in the region to be served? By investigating specialized treatment facilities in the area, one may learn much about related needs that are currently unanswered. For example; it is very common to find a high number of individuals requiring cardiac care living within easy driving distance of a cardiac care treatment facility. While receiving excellent cardiac care, other aspects of good rehabilitation, such as communication aids, wheelchair assessment and seating, etc., might be lacking.
- Are there places in the region that disabled persons now go to get services? Will those service providers cooperate in providing information on unanswered needs? When asked, other health care workers will often gladly assist in supplying information about unmet needs, possible improvements, and innovations in rehabilitation programs. In developing contacts (potential customers) during the market assessment phase, the new service provider will very likely gain the loyalty of those individuals. The analogy here is that if a person feels they have had input to the plan, they will happily assist in the plan's success. On the other hand, if they feel that they have something to offer but are not asked for input, they will take pleasure in saying "I told you so," if and when the plan fails.
- What are identifying features of the people who I want to serve? By clearly understanding the characteristics of the group or groups of disabled persons to be served, a much clearer framework for providing services will emerge. Characteristics such as age, extent of physical and mental disabilities, housing, care givers involved, etc., will be important in planning to provide adequate services.

There are several guides available for determining market size and trends, depending on the type of product and/or service being considered. One such guide, Conducting Needs Assessment, A Program Portfolio Resource Manual, is published by the National Easter Seal Society. Regardless of how the assessment is done, dur-

ing the course of investigating needs of disabled persons in the community the service provider will undoubtedly make numerous discoveries of valuable information which may be used later in implementation of a marketing plan.

Customers

In planning for the sale of any product or service, one must be aware of who makes the buying decision. With most consumer products the buying decision is made by an individual consumer after he or she assesses the attributes of a product or service being offered. When the item is considered a major purchase or is sophisticated in some way, the buyer is usually able to consult consumer reports or in many cases bring along an informed friend to help make a selection among various options available.

A buying decision in the case of most rehabilitation products and services is much more complex. While the end user often plays a role, many other individuals are frequently involved in the selection and purchase of a product or service. The size of the group involved may vary widely. Depending on the items or services being considered, the customer or customers may include family members, nursing staff members, therapists, physicians, case workers, funding agencies, other rehabilitation engineering personnel, and an assortment of other interested care providers.

In planning for the distribution of a product or service, it is important that the service provider investigate and identify the customer(s) who are likely to be involved. Remember that any unanswered question will result in a delay or loss of the prospective sale. To avoid this costly and time-consuming cycle, one must take the time to assess the needs of each person involved in the buying decision.

Consider the case of a disabled worker who requires a switch to be installed at a work station. The vocational rehabilitation counselor has determined that a piece of machinery may be accessible to the worker if only some type of electronic switch can be found to activate the device. When asked to supply a switch, the rehabilitation engineering service provider will be able to complete the job more quickly and efficiently when aware of the needs of each person involved with the buying decision:

1. The disabled person must be satisfied that they will be able to activate the switch successfully and operate the machine.
2. Installation of the switch should not prohibit other workers from using the machine. Several other workers may be asked to demonstrate this feature.
3. The vocational rehabilitation counselor must be satisfied that the switch will work and will require little or no maintenance.
4. The funding provider for the device may need documentation attesting to the usefulness of the device before funding may be approved.

This documentation may involve an occupational therapy assessment, physicians referral, insurance authorizations, etc.

With all of the involved individuals identified, a service provider can now direct the sales effort to meet the needs of each person. Efficient delivery of service has often been delayed or denied simply because one of the important decision makers was left out of the process or received wrong information.

Competition and Other Service Providers

It is said that imitation is one of the highest forms of flattery. In supplying any product or service, when there is a true need and one service provider begins to fill that need successfully, it will not be long before another supplier appears.

In offering rehabilitation engineering services, competition and other service providers may at first appear threatening. However, in many communities this is not the case. Suppliers of similar services, so long as they are not directly competing for the same business, may be glad to share their experiences and provide high-quality advice and assistance to one another. Working together in the community, private and public service providers can build a comprehensive, well-organized program where all contribute to the betterment of the community and their respective business operations.

On a larger scale, professional association with other service providers can be very helpful in improving technical expertise, business operations, and overall capabilities. National organizations such as RESNA, the Association for the Advancement of Rehabilitation Technology, the International Society of Augmentative and Assistive Communication (ISAAC), and others are good examples of rehabilitation service providers working together to advance the field of rehabilitation.

Estimated Market Share and Sales

To predict with any certainty the number of clients to be seen and the number of devices or services to be dispensed (sales) in a given period is a difficult task. This task is especially difficult when launching a business or adding a new component to an existing program. Yet, before people or funds can be allocated to the task, numbers must be generated indicating the level of need, number of actual sales that are likely, and the rate at which those sales will take place.

Estimating the total need (potential market) for a product or service is not enough. In assessing the need for any rehabilitation service, there will be a long list of reasons why potential clients are not likely to take advantage of the services available. A list of reasons why a client might not be served may include the following;

1. Some clients may not be eligible to receive funding support.
2. Some clients may not be able to travel to the service providers location to receive service.
3. Some clients may not be willing to try new products, especially when equipment might be somewhat experimental.
4. The service provider may have no way of communicating with all potential customers, leaving some individuals unaware of the services available.
5. The service provider may not have the mandate to service some customers due to regional boundaries, age restrictions, etc.
6. Clients may be receiving services from another service provider with whom they are satisfied.

The rehabilitation service provider will not reach 100 percent of the potential market. However, to set achievable goals, it is important to understand the potential market size and to develop a strategy for penetrating the market and increasing market share over time through the use of a marketing plan.

In a new program, market research, customer identification, and the assessment of existing service providers must be done with care so that goals set for the new service can be met. In industry there are many examples of product launches where

inadequate research prior to starting the program led to unrealistic goals, resulting in disappointment and cancellation.

In operating an existing program, most managers wish to increase the level of activity year after year. To continue to grow it is important to understand the size of the market relative to current demand. When studying market share, what the operator of an existing program or business is looking for is ways of increasing users among groups within the potential market. For example:

> A private practice rehabilitation engineer wished to increase the number of customers currently using her services. Upon studying the local market, she found that potential customers included two children's treatment centers, one adult rehabilitation center, and a local vocational rehabilitation agency. She also knew of several other potential users of service but was unable to identify methods for obtaining payment from these.
>
> In the past year she had provided services to one of the children's treatment centers through a retainer contract negotiated annually. She had also done one job for the other children's center.
>
> After discussing the possibility of providing services to the adult rehabilitation center, she discovered that an inhouse prosthetic/orthotic shop did some rehabilitation engineering work. She met with the director of the shop to find out how frequently rehabilitation engineering services were being provided. After discussing the possibility of providing services to the vocational rehabilitation program, she found that the staff currently made up their own aids and devices with widely varying success. She was unable to discover how frequently this work was being done. However, the program director said that $3,000 had been spent on materials, mostly plywood, flexible foam, and some electrical switches in the previous year. Several of the vocational rehabilitation counselors were eager to speak with her about problems they were having in designing special devices for particular clients.
>
> With the knowledge that she was currently filling the demand at one of the children's centers, she decided to spend at least four hours per month in an effort to get more work from the other local children's center. Since the adult rehabilitation center already had a supplier, she decided to keep in regular contact via promotional mailings and telephone calls, but not spend time promoting her services unless requested to do a specific job. Since the vocational rehabilitation center had demonstrated a need for service, she decided to offer to assist in two trial assessments at no charge. She also planned time for vocational counselors to visit the children's center where her ongoing contract work took place.

In this example, the service provider completed a simple market study, assessed current market share, made decisions with respect to other service providers, and opted to concentrate efforts were positive results were most likely to occur.

Products

Product Development

In developing the product line for a service delivery program, the team must take care to ensure that as each new device is added, the team have the tools and expertise necessary to effectively utilize the technology. As the program matures, it is likely that the product mix will consist of devices developed on site, devices im-

ported from other centers, and commercial products generally available in the market place.

Generally, new product ideas and improvements are most likely to come from the people working closely with clients and from the users of the service. However, the development of a new idea through to a finished product is a long, costly process. It can not be done by the service delivery team without disturbing the efficient flow of customers through the system. The following example illustrates this case:

> A client came into our center six months ago. After assessing his unusual needs, rehabilitation engineering decided to make up a most ingenious product in an effort to make him more functional. In making the device, problems arose, and it took two months longer than expected to develop the device. Finally, when the client returned for fitting, the new device needed several unexpected modifications. With the added changes, the cost was higher than expected. The clients funding source paid some of the cost difference and our center assumed the remainder. Since we had not made this kind of device before, it broke down several times in the field and needed repairs. Our center makes repairs at no cost during the first three months of use. Fortunately, this approach is not required very often or we would never get anything done and be bankrupt many times over.

In this scenario, the rehabilitation center filled an individual need, but lost time and money in the process. The client got a device but at a higher cost than he was initially told, late delivery, and several breakdowns before the service provider finally got the job done right.

There seems to be little one can do to avoid this scenario when working in a rehabilitation engineering center. However, one must be aware of the short-term and, more importantly, the long-term costs of developing products and producing products at the same time.

If the goal of the rehabilitation engineering center is to operate an effective service delivery program, the kind of product development referred to in this story should not be done by the service delivery team. In some large, well-equipped facilities, a separate group may exist that is set up specifically to handle clients whose needs cannot be met using the repertoire of products and services dispensed by the service delivery team. This separate group may take referrals from several centers located nearby.

Product Lines and Policies

With the needs of consumers in the marketplace identified, the service provider can then make good decisions about which products and services to use in meeting those needs. As time passes, limitations in the technology become apparent and additional products and services are added to complement existing programs and encourage growth.

In operating a rehabilitation engineering service delivery program, as with any business, it is important to develop and maintain a suitable product line, consistent with the goals and objectives of the marketing plan. The process of developing the product line never ends. What is important in developing the product line is to add products and services that complement existing programs and ensure that the support services, advertising, and pricing plans are put in place as new services are added.

In providing service, the rehabilitation engineering team will see areas of need in the client population that are currently not being served. While the urge is great to

immediately begin providing services and equipment to fill these needs, care should be taken to first do a thorough needs analysis and develop a marketing plan before providing products. There are numerous examples of companies expanding operations too fast, adding product lines with which staff are unfamiliar and with no marketing plan for guidance. All too often the effort ends with unsatisfied customers and in some cases the loss of the business entirely.

Operating policies regarding product lines are required to operate a successful sales/marketing program. Personnel must be aware of exactly what the limitations of sales/service are and hold to them. A firm adherence to policy and standards will go a long way toward reducing the "designing as we go along" attitude and its inherent failures/problems.

Sources of Supply

Choosing appropriate sources of supply is essential in providing prompt, quality service. For most rehabilitation service providers, the choices for supply range from custom fabrication of equipment inhouse, purchasing off-the-shelf, ready-made products, or purchasing subassemblies or ready-made products from other custom fabrication shops (often other rehabilitation centers).

Having custom fabrication equipment on hand allows the service provider excellent control over the manufacture of all devices to be dispensed. However, this may lead to a concentration on custom fabrication rather than a rational assessment of the buying versus making option.

Off-the-shelf, ready-made products are often technically superior to those that can be fabricated using the tools on hand in a rehabilitation facility. This is especially true when considering aids that are widely used by many people. Not many rehabilitation service providers would consider manufacturing a wheelchair given the selection available in the marketplace. However, there are still many occasions where an off-the-shelf product does not exactly meet the users requirements. In such cases, the service provider must choose between an off-the-shelf device with modifications versus custom fabrication.

Sourcing useful supplies and products takes time and effort. Productivity in supplying services is usually better when staff see more clients and spend less time in manufacturing. With the objective of increasing the number of clients served, the service provider must make an effort to be aware of and use commercially available equipment when possible. However, the service provider must at the same time be prepared to modify or fabricate devices when similar devices cannot be found.

Service and Warranty Policies

Internal operating systems used by individual rehabilitation service providers vary widely, depending on funding restrictions, sophistication of equipment, and services to be provided. To facilitate the smooth operation of programs and ensure realistic customer expectations, it is important to develop service and warranty policies covering all aspects of the business. For best results, policies must be developed in consultation with customers.

For warranties covering repairs, service, and additional modification to specialized rehabilitation equipment, the service provider must carefully develop a warranty policy and then take measures to ensure that both customers and the rehabilitation staff understand the extent of the warranty.

Funding for modifications to a device after initial installation is a good example of the importance of thinking through the warranty policy before dispensing a device. It is very common that funding may be obtained for the purchase of a

device but will not be available for any repairs, maintenance, or modifications. Therefore, the service provider must include all charges associated with the sale and maintenance of the device in the initial cost estimate and be prepared to supply after-sale services as outlined in the warranty.

The importance of warranties is not limited to the purchase of technical hardware. Rehabilitation service programs providing consulting and training services should also develop warranty policies. For example, prospective employers taking placements from a vocational rehabilitation program should be made aware of exactly what follow-up services will be available as they endeavor to train disabled employees in the workplace.

Marketing Plan

Overall Marketing Strategy

The following fictional tale illustrates how a company's marketing plan led to success:

> After studying the need for widgets, Perfect Manufacturing & Marketing Company, Inc., decided it would like to make these devices for general distribution. Upon examining strengths and weaknesses of their organization, they decided to get started on the project. However, they would have to closely monitor sales and profits in the first year before making an increased commitment, possibly in the second or third year of production.
>
> The company investigated to identify the kind of person who would probably have a need for widgets and could afford to pay for them. They then went to work and designed a better widget for use by the average consumer.
>
> Knowing that the resources available to the project were limited, the company developed a public education program that would appeal to those people who needed and could afford to buy widgets. The company distributed this information in a few selected communities where the market survey showed they might yield the maximum return on investment.
>
> Having estimated the number of people in the target communities who would probably buy, the company assigned just enough production staff and resources to make the needed widgets.
>
> When the company felt that most of the people in the first communities who were going to become customers had done so, and that these customers were happy with the quality, service, and performance of their widgets, the company began circulating promotional information in neighboring communities. The staff were always careful not to circulate information so fast that the production department could not keep up to the increasing demand.
>
> As time went by, profits were made and reinvested in widget production. Sales staff, widget servicing staff, and advertising materials were refined. Only a particular type of person received information on the company's product, but nearly every one of these people bought at least one widget each year.
>
> The company is now the leading widget manufacturer in the Western World. They take time on a regular basis to study the market and ensure that they are not falling behind in the technology, that they are reaching every possible customer in the areas they serve, and that they cut back on resources being used inefficiently.

> Last year they began making didgets. It seems that just about every person who owns a widget uses didgets as well.

All activities associated with the movement of goods and services from the rehabilitation service provider to the user are part of the company's marketing strategy. Most rehabilitation centers do things that are clearly an effort to increase customer satisfaction, increase the number of clients served, and increase sales. As these activities are all part of marketing, to be successful they need to be examined, coordinated, and executed as part of an overall marketing strategy.

Questions that are answered in developing a marketing strategy include the following:

- What products and services are we going to concentrate on in the future?
- How many people will we serve in the next year, two years, five years?
- Who and where exactly are our customers?
- How will we go about informing and encouraging people to use our services?
- How many of our staff will be involved in our public information and sales?
- How many of our staff will be involved in production, service, etc.?
- What profits do we expect to get in return for our efforts?
- How are we going to follow-up to ensure our products and services are working for our client and for us?

Pricing

In providing products used in rehabilitation, a large group of goods and services are produced, nearly always in small quantities, all of which usually require selling by qualified professionals. This is an expensive way to do business. It can not normally be done without high markups at every stage from fabrication to dispensing or by the continued injection of large subsidies from outside sources.

The costs of bringing a product from the conceptual stage to the consumer are many. Regardless of technology, the price an end user must pay inevitably includes many components:

Design and Development
Prototype Construction and Testing
Tooling
Production Overhead
Raw Materials
Manufacturing Labor
Quality Control Programs
Packaging
Marketing
Advertising
Selling and Servicing

In some public rehabilitation centers, not all of these costs are visible in the price a user pays for the goods and services provided. However, the costs must still be paid through funding from other sources such as government, private donations, grants, etc.

In developing a pricing structure, the service provider must first make a detailed list including all the costs involved in providing the product. If outside sources of

funds can be brought in to offset costs, these funds must be quantified and allocated against suitable cost categories. All remaining costs must be passed on to the customer or absorbed by the service provider.

For various reasons, some rehabilitation engineering service providers seem to undervalue their services when establishing prices. This is especially hazardous when done by a new, inexperienced service provider. The practice drains resources and stunts growth. In some cases the continual drain of funds is responsible for the premature end of a program.

With most products and services, underpricing or overpricing hurts everyone including rehabilitation service providers, clients, and client support care workers. In cases where a price is too high, services will be financially out of reach for many potential customers who might otherwise benefit from the technology. In the case where a price is set too low, service providers will soon find themselves unable to provide after-sale support and may discontinue the program altogether, leaving existing users with no service support. Without maintenance, many of the devices sold will soon be out of service.

Examples of Two Costing/Pricing Methods Used in Rehabilitation Engineering Service Delivery Programs

Example 1

Price = (material cost x markup) + (labor costs x markup) + (other costs x markup) + (rework allowance)

This method is often used when custom fabrication of a device is required. To be used effectively, the service provider must continually maintain job production cost files as a data base for future quotations. Markups vary from facility to facility, depending on overhead costs. Other costs may include assessment fees, after-sale servicing allowances, travel costs, etc. Jobs must often be price quoted and authorizations approved before work may proceed. The rework allowanced is especially important when providing equipment or treatment programs that may require modification before efficient operation is achieved.

Example 2

Price = (standard cost for equipment components x markup %) + (other costs x markup) + (rework allowance)

This method is used primarily when dealing with finished or partially finished goods. Direct costs must be easy to identify, allowing the simpler quoting method. Other costs, including final assembly and adjustment time requirements must be carefully estimated. The rework allowance here is the same as in the previous example.

Generally, in operating a service delivery program it is much easier for the supplier to stand behind a pricing scheme once all costs are understood. The time spent in continually monitoring costs, selling price, and profit margin will result in long-term stability and growth for the business.

Distribution Channels

One of the best ways to assess the quality of a distribution channel and improve its effectiveness is to seek out other similar service providers and compare programs. Programs that have been in existence for many years often have a well-documented

path identified for the provision of service. Even in seemingly unrelated fields one may find helpful information which can be used to increase the number of clients served while at the same time maintaining control over a high-quality delivery system.

In the early 1970s in Ontario, Canada, special postural seating for disabled children was available only at the Ontario Crippled Children's Treatment Center in Toronto. Staff at this facility recognized a need for the service. They developed therapy and medical staff to assess clients, set up a manufacturing shop to build the equipment required, and organized funding sources to pay for services provided. The center fostered an evolution of a wide range of technical equipment and developed a suitable service delivery program to accomplish the objective. Fifteen years later, special seating is now provided through similar delivery programs in at least 20 cities in the province.

In planning for the distribution of rehabilitation engineering services it is important to spend time researching what it takes to do a quality job in providing the goods and services to be offered. Resources must be clearly identified and coordinated to achieve intended results.

- People (Clinical Staff): physicians, assessing therapists, nursing staff, technicians, sales and marketing staff, medical equipment suppliers, and dealers. Many people may play important roles in providing the service.
- People (Client & Client-Support Staff): Clients and other people who represent the interests of clients may play a significant role in allowing services to be provided (see the previous section, "Customers").
- Physical Plant: Specialized facilities may be needed to properly assess and dispense services. Examples include soundproof rooms used in hearing tests, gait labs used in ambulation assessment, and vocational assessment workshops.
- Tooling and Equipment: Specialized tools and equipment may be needed in assessment, construction, fitting, and maintenance of devices.
- Funding Sources: When providing any rehabilitation aid or service, there is usually a need to obtain funding before proceeding with implementation.
- Transportation to and from the point of service delivery: Potential clients may be able to travel to a central location to receive services. If not, the provider may have to travel to various locations.

If any key resource is not included when distribution channels are established, the quality of the entire program will suffer. It is imperative to understand the sequence required for delivery and then set up appropriate distribution channels needed to do the job. It is equally important that people operating in the field have a clear understanding of how the system works. There are numerous accounts in rehabilitation engineering where the system was violated, resulting in substandard service or service denied.

The need for control over distribution of goods and services is not unique to the rehabilitation engineering industry. Many products have gone through cycles of development, tight distribution control, looser control, followed by more stringent control when conformance to quality standards, service, and suitability of applications gets out of hand. Nearly all products and services have minimum requirements for assessment, dispensing, and maintenance service. To obtain sustained growth, it is important to identify key factors for successful product delivery and to build a program that refines those things that encourage product success.

Sales Tactics, Advertising, and Promotion

> I recently received by mail a one-page flyer promoting the work done by a rehabilitation engineering program. The flyer told me about the highly qualified people involved, how they worked together to assess problems, develop suitable aids and devices, and help clients overcome a wide variety of disabilities. There was also an accompanying letter inviting me to access this remarkable program by referring patients in my care to their clinic. They also said that the waiting list was very long and I would not be able to have my clients assessed for at least six months. The letter came to me from a clinic located over 500 miles away, in another country.

Direct mail is a commonly used tool in promoting many kinds of services. However, as in this example, advertising and promotion of service must be carefully planned and implemented to achieve the goal of increased sales. If the advertising campaign is out of step with production capabilities or the campaign is directed at the wrong target population, results will be discouraging.

Before launching a sales and promotions campaign, the rehabilitation service providers must first be sure they will be able to respond appropriately to the expected increase in demand for service. If the service provider promotes a service and then cannot fulfill new expectations created by the campaign, the result will undoubtedly be negative publicity for the program.

It is important to control the distribution of information to ensure that the audience understands what is being said and to ensure that the information is sent to those in a position to act. Several different information packages may be required for distribution to various kinds of customers using the same service. Promotional information directed at agencies providing funding will be very different from promotional material directed to physicians and treating therapists providing patient care.

For many rehabilitation service providers, potential customers are often easily identifiable. Clients may be found in facilities such as hospitals, nursing homes, schools, funding agency offices, and regional facilities offering special care. This clumping together of potential customers is ideal for promoting services through organized presentations to staff. The planning and execution of inservice presentations using sample products, slides, videos, and printed handout material is one of the most widely used methods of increasing orders. It is also very likely to be the best way to reach potential customers. Not only can one do an excellent job of promoting services available during an inservice presentation, but at the same time the service provider can do market research, uncovering unanswered needs, finding out if previously installed equipment is working properly, continuing to provide satisfaction, and identifying specific objections to services currently offered.

The next level of sophistication above inservice presentations is to provide training sessions for new and existing users of services. Training is a component common to nearly all areas of rehabilitation. The exercise is often thought of as only a follow-up for past sales. However, it also increases future sales as more people learn how to access services and order the product. This rule applies equally to users of equipment and to staff members involved in care at other locations in the community.

A survey of sales literature and materials commonly used to promote rehabilitation engineering programs includes the following:

- General brochures and pamphlets outlining goals and objectives, services available, staffing, etc.

- Various standard information letters.
- Business cards.
- Standard assessment and prescription forms.
- Testimonials from satisfied customers.
- Standardized funding-approval forms.
- Labels attached to finished products identifying the supplier and a telephone number to call for servicing.
- Periodic newsletters informing customers of new developments.

Ongoing Market Evaluation

Analysis of Marketing Efforts

A well known pocket book, Putting the One Minute Manager to Work, suggests ideas for working with people and achieving success. The PRICE formula is one of many easy-to-remember maxims included in the book.

P Pinpoint the results you are looking for.
R Record activities as they occur in the workplace.
I Indicate what is needed to keep the team on track toward the goal.
C Coach the team along the way.
E Evaluate performance regularly to find out how things are progressing.

Keeping track of and evaluating progress at every step of the way is important in effective implementation of the marketing plan. This simple formula sums up what must occur in any organization if goals are to be reached.

Once the service delivery program is operating, frequent evaluation is required to keep the team's efforts directed toward goals. The initial market research provides a measuring stick against which the team can compare performance. As each evaluation is completed, the service provider gains further insight into needs in the community and is also able to see the effect of recent efforts.

Information required to assess ongoing performance must be built into internal operating systems. Reporting systems are usually controlled through a business or accounting office. These reports provide regularly updated information about the effectiveness of the marketing efforts and effectiveness of equipment in the field. Many characteristics of users who have purchased products or services are recorded for future reference in planning program changes and launching new initiatives.

Analysis of Sales Volumes and Customer Satisfaction

Most rehabilitation service providers actively seek information about the level of user satisfaction with services provided. Follow-up visits, questionnaires, and periodic visits to client's residences are typical ways of obtaining this kind of data. Ideally, written sales reports "by product and by customer group" should be prepared monthly, quarterly, and annually in an effort to compare actual sales volumes against target volumes.

Most simple accounting systems will provide such information as the total value of sales in a given period. However, it is essential in managing the marketing plan to know where current sales originate. Only by gaining an understanding of where sales originate, can the marketing strategist decide where the program currently

resides with respect to an overall plan. Armed with this information, the team can then decide what marketing, advertising, and promotional steps should be made.

Marketing Costs

In industry, the ratio of marketing costs compared to the overall budget of an organization varies widely. Generally, businesses selling complicated products require intensive consumer education programs and provide individualized services. They must spend considerable dollars to ensure their message is getting through to potential buyers.

Marketing costs are usually budgeted annually. At that time, a detailed list of all planned marketing activities should to be compiled. All activities must be examined to ensure that they conform to marketing objectives of the organization. To be successful, activities must be adequately budgeted and staffed to accomplish the identified tasks.

Attending trade fairs, printing brochures, and attending inservice presentations costs money and takes time. Most importantly, marketing costs are never one-time expenditures. To achieve a successful program requires a sustained effort, constantly keeping the company's products and services in front of potential customers.

Future Prospects/Forecasting Future Demand

Accurate forecasting of future demand can only be done if the organization makes an effort to track previous sales statistics. In most industries, when an initial market study is completed, the market survey team always takes careful note of how well competing products have done in the marketplace.

In predicting the number of clients likely to be served, the number of devices to be made, the number of assessments to be done, improved accuracy will be achieved by making a list of current customers and noting the level of activity to date. Targeted consumers should be listed and rated individually as to their "readiness to buy." The "readiness to buy" of a targeted consumer of services should be gauged according to marketing activities planned for them in the upcoming time period. Using this kind of detailed approach to forecasting significantly increases the confidence of the planners and the accuracy of the plan.

Forecasts are often done using one-month time periods so that seasonal fluctuations can be reflected. In providing rehabilitation services, such events as school breaks, seasonal holidays, and upcoming hospital accreditations will play a role in the sales forecast. Finally, when monthly totals are calculated, they may be increased or reduced by the application of safety factors. Armed with a well-thought-out forecast, the rehabilitation service provider has an excellent tool as part of the overall marketing plan.

Through the process of measuring demand, planning, providing service and then assessing effectiveness, the rehabilitation engineering center will achieve steady, sustained growth and be a valuable asset to the community.

Additional references on Marketing can be found in Chapter 7, Resources.

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CHAPTER THREE:
PROGRAM DEVELOPMENT AND IMPLEMENTATION

Douglas A. Hobson
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Introduction

This chapter is intended to provide recommendations on the development and early implementation of a Rehabilitation Engineering Technology (RET) service program. Other authors have referred to th' field as Rehabilitation Technology; we have chosen the narrower scope as implied by RET. As with all guidelines, limitations and precaution should be exercised in accepting them. The primary limitation is that the recommendations are biased by the unique experiences of those individuals who have developed them. That is, the nature, scope, degree of success, or failure of any program is dictated largely by the past experiences, professional interests, and commitment of those in leadership roles and by the strong influences of the environment in which the programs have been developed. Within the sphere of these realities, we have attempted to provide guidelines for program development and early implementation that draws upon the experiences gained by leaders in approximately 15 existing RET service programs. These programs are representative of the seven models described in detail in Chapter One. A synopsis of these models is presented in this section since they are referred to throughout the remainder of the chapter.

Type 1: Durable Medical Equipment (DME) Supplier

This is usually a commercial facility that markets a full range of rehabilitation aids including wheelchairs, canes, walkers, commodes, soft goods, etc. Of particular interest to RET services are those DME suppliers who have expanded their services to include rehabilitation products and services for the more severely disabled. These products may include specialized seating and powered mobility devices, communication aids, and environmental control devices. They usually have specially trained personnel that attend clinics in major rehabilitation facilities and function as a member of a clinic team. The DME supplier is often viewed as the primary source of technical expertise and equipment, as well as a source for maintenance and repair service. The DME supplier will often assist a client in submitting for funding approvals and assume responsibilities for collections from third-party payers.

Type 2: Department Within a Comprehensive Rehabilitation Program

In addition to participating DME suppliers, larger rehabilitation programs may have inhouse RET service capabilities. This capability may reside within a therapy department or be independent. In general, these programs will have varying degrees of technical expertise; ranging from rehabilitation engineers with full clerical and technical support, to therapists fabricating simpler aids using basic shop tools. The inhouse program may be self-supporting on a fee-for-service basis or have a portion of its program costs covered under the global budget of the center. This inhouse environment creates an opportunity for multidisciplinary team involvement, which can include comprehensive evaluations, regular clinics, both inpatient and outpatient ser-

vices, organized follow-up and documentation, and educational opportunities for new team members. The nature of the services will vary depending on the population served and technical and therapy capabilities of the RET program. In general, a high reliance is placed on commercially available products, followed by modified commercial devices, with a minor percentage of time being committed to design and development of unique "one-off" solutions.

A modification of the inhouse RET model is to have a complementary outreach capability. This can take several directions. One approach is to have RET teams that visit other clinics and/or facilities to undertake medical, therapy, and technical evaluations followed by the clients coming to the central facility for technical services. Another approach is to have an equipped van that travels out to various facilities or work sites to provide services on site.

Type 3: Technology Service Delivery Center in a University

This is a RET service program that is often the outgrowth of a rehabilitation engineering research and development effort. In general, the organization is similar to the inhouse rehabilitation center model, except that there may be a greater focus on research developments, outpatient services, and education and training of RET personnel. The nature of the RET services provided are often biased toward the core area research focus of the program.

Type 4: State Agency Based Programs

Several models exist within state agencies. In vocational rehabilitation (VR) agencies there are those programs in which the technical personnel are located within major vocational rehabilitation and training facilities (Virginia, Tennessee). In other states, technical personnel are located primarily within staff offices (North Carolina, California). The scope of services is generally confined to clients who are VR eligible and have job-related needs.

In state Special Education Departments there are assistive devices programs being developed to meet a wide range of technology needs in special education. These services can include inservice training, technical evaluations, equipment loan pools, and direct provision of RET devices within special education environments.

Type 5: Private Rehabilitation Engineering Technology Firms

Distinct from DME suppliers and the other models indicated above, professionals with rehabilitation engineering background are establishing private consulting services. These individuals may consult with private insurance carriers, state VR agencies, rehabilitation clinics, industry, and major rehabilitation centers regarding a wide range of technical applications in the rehabilitation field. To date this is a relatively small number of individuals.

Type 6: National Nonprofit Disability Organizations

Several RET service programs are being developed within the framework of local chapters of national nonprofit organizations such as United Cerebral Palsy and Easter Seals. These programs can vary considerably in scope and focus, but in general seem to be outpatient based with a concentration of services in the areas of augmentative communication, computer access, worksite modifications, independent living, and comprehensive functional evaluations. An example of this model is the Cerebral Palsy Research Foundation of Kansas, Inc., which has created inhouse employment opportunities through the assessment of physical capabilities, the ap-

plication of worksite design and modification, installation of needed technology, and long-term industrial contracts. Also, this program has been expanded to include specialized seating and augmentative communication technology for special education environments in the Wichita area.

Type 7: Volunteer Organizations

There are several models that exist for the provision of RET services using a volunteer network. We tend to look toward the exemplary programs outside the United States, especially Rehabilitation Engineering Movement Advisory Panels (REMAP) in Great Britain and Technical Aids to the Disabled (TAD) in Australia. Both programs are similar in that they are organized networks of volunteer technical and professional rehabilitation service providers working cooperatively. Services are rendered at the community level by the volunteers on a case-by-case basis. The administration of the two programs differs in that REMAP relies on volunteer local advisory panels, while TAD relies on a paid director with clerical support to collect, process, and disburse referrals to appropriate volunteers.

There are, however, several interesting models in the United States. A volunteer model that has existed for many years is the Telephone Pioneers of America. These telephone company volunteers have built and maintained sensory aid devices for deaf and blind people, adapted toys for disabled children, etc. The Volunteers for Medical Engineering, Inc. (VME) was started in 1982 by John Staehlin, a design engineer at the Westinghouse Defense and Electronics Center in Baltimore, Maryland. VME is becoming more integrated with the rehabilitation community and is developing several innovative approaches for technology transfer. The Rehabilitation Engineering Volunteer (REV) Network in New Jersey is conceptually close to the TAD system, and shows that this collaborative approach is indeed viable in the United States. Volunteers are also integrated into several of the other six types of service delivery models, as noted in Chapter One.

Summary

It is presumed that the reader will be attempting to develop or administer a RET service program that falls within one or more of the above seven models. The organization of the remainder of the chapter follows the process one would use to plan, develop, implement, and evaluate a new program for RET services. An attempt is made to be general and thereby maintain relevance to each of the seven models. However, we caution that these guidelines must be interpreted in light of factors critical to each model and unique to each environment in which the new program is being developed. The final section (Models from the Field) summarizes specific experiences and recommendations from people who have actually developed programs within most of the models outlined above.

Analysis of Environment

The first step in developing a new program is to gain an understanding of the environment in which the program is to function. Basically, what needs to be determined is the services already being provided, the services that are needed, the size of the need, the potential referral sources, the existing resources that can be called upon, who facilitates or authorizes payment for the planned services, and how will success/failure be measured. The answers to all these questions are not always easy to obtain, because many people will not understand the nature of the proposed services and therefore cannot commit to utilizing them or answer detailed questions in

advance. Ideally, one wishes to bring new services to a community in which there is no competition. A rule of thumb may be helpful. In general, it takes at least a population of one million people to support a comprehensive, self-supporting, fee-for-service RET service program. If one is planning a comprehensive program and determines there is a catchment population of less than one million, or the ratio of RET service providers to population is greater than one per million, serious consideration should be given to alternate strategies if self-sustaining financing is the goal.

One of the key questions is what type of RET services are in demand in the proposed catchment area. For example, suppose one proposes to develop an inhouse RET program in a rehabilitation center that will serve the host facility as well as surrounding communities of 1.5 million population. However, there exists a number of well-established DME dealers that work well with most therapy departments. Also, they have gained good experience in wheelchair prescription, specialized seating, powered mobility, and augmentative communication. The only real unmet needs in the community are for custom designed mobility control or augmentative communication interfaces or difficult on-site worksite modifications. Although the community has real unmet needs, they are not of the type for which fee-for-service payments can be expected to cover the operating costs on an ongoing basis. Therefore, the program will require in-kind sponsorship or marketing of its services in such a manner that referrals will be attracted from the existing competition. This latter approach will, in all likelihood, be a slow, uphill process that will require significant sponsorship for at least two years. In fact, a candid analysis of the financial projections may yield a "no go" decision.

Chapter Two (Marketing) provides more extensive guidance on obtaining answers to many of the above market analysis questions. It is highly recommended that significant effort be expended on the early analysis of the proposed program's environment, before any serious effort is committed to the following details of program planning.

Program Planning

The importance of preparing a program plan with both short- and long-term objectives cannot be overemphasized. It contains the results of the environment analysis (market study) and the justification for staff, space, and capital investment. It contains information on costs versus income projections and when profitability can be expected. It includes the mission statement and the "road map" for its achievement against which future priorities can be weighed when pressures mount to be "all things to all people." Most importantly, it is a tool for communicating these crucial concepts and projections to those who must provide the start-up capital and other resources. Finally, the plan contains the details for the start-up phase, including the strategy for marketing the program to the community.

Of course, the specific details on each of the above facets of the plan will vary significantly, depending on the type of program being planned. For example, an RET program plan that is designed to provide mainly evaluation services and use commercial fabricators will reflect little need for inhouse equipment and space requirements. However, this decision may mean a lower number of jobs completed in a given time period, thereby reducing income and possibly increasing the waiting time to clients. Increased waiting times may mean reduced referrals and revenues in the long term. The point is that the planning phase offers an opportunity to weigh various alternatives once the target population and the nature of the services have been determined. A final step in the program planning phase should be the securing

of a clear statement of support from those in authority for the program plan; including its budget projections. The approved plan should be the basis upon which all involved parties embark on the development of the program. As one program reported,

> "Although the hospital has been committed to the establishment of a comprehensive rehabilitation engineering delivery service, the start-up phase has proven to be immensely challenging for the staff people charged with the task. Perhaps the biggest frustration has been the mosaic of differing expectations that have been formulated by the staff, administration, and patients. The advance publicity for the hospital had heralded its intent to use the latest and most advanced forms of technology in the care of its patients and in the conduct of research. Yet no one in the administration had any prior experience with either the development or use of such a capability and therefore had no concept of the process by which such a service would be designed and implemented. There had been no effort to establish an administrative plan for linking the distinctly different organizational needs of different services, leaving the principal staff persons to develop their own plan of cooperation and shared utilization of faculties."

Program Development

Once the environment analysis yields its results and the basic plan has been formulated and given administrative approval, focus can be directed on the development details of the program itself. It is recognized that every program will probably be a variation of one or more of the basic models outlined briefly in the first section of this chapter. At this point, the program developer(s) should have identified which model(s) theirs most closely emulates. A review of the field experiences presented in the final section of this chapter, Models from the Field, may be helpful at this point. During the development process of most programs there are common features or elements which eventually need to be addressed. In most cases it is prudent to address these elements sooner rather than later. Before focusing on specifics one major influencing factor needs to be discussed. It filters down to the question as to whether or not the program will have the capacity to design and actually fabricate technical devices. The bias of the authors is that commercial products cannot be directly purchased and provided to severely disabled people without either minor or significant modifications. This means that the RET service requires access to technical resources to modify available devices or design and build unique aids as required. These technical resources can be inhouse or be purchased external to the program. In general, external purchase is not an effective and efficient approach because it can lack consistency, introduce fairly high expense and unacceptable delays, and the individuals involved often do not feel the same degree of commitment to problem solving as those that are actually part of the inhouse team. In general, this view is reflected throughout the following recommendations, especially as they relate to facilities and staff recruiting.

Staff Recruiting and Development

Qualified people in RET service delivery are in short supply and high demand. Once program staff have been recruited and received the secondary training and/or experience they may require, they will be the program's most valuable asset. It is highly recommended that the program planning and development be undertaken by

the person that will ultimately assume responsibility for the daily administration of the program (program director) . It is likely that the program director will require additional training and exposure to existing programs, especially during the planning and development process. This may require actually visiting two or three programs early in the planning process that have similar objectives. Also, many of the medical, technical, and therapy personnel will require specialized training in the field of RET services, especially if they have not previously worked in this field. The annual conference of RESNA, Association for the Advancement of Rehabilitation Technology offers the best opportunity for both general and specific learning experiences. Throughout the year there are also specialty courses and professional conferences that can supplement the RESNA learning experience. Planned visits to other sites is probably the most effective method for professional and technical support staff to rapidly gain knowledge in specialty areas, such as specialized seating, vocational worksite designs, powered mobility, augmentative communication, and general organization of the service delivery process. Training experiences that involve a team of at least two people of dissimilar backgrounds often have much greater impact than if only one person gains the new knowledge. Investment in training of personnel is usually repaid rapidly since new or improved services can be rapidly offered to the community. Also, repeating the start-up mistakes of other providers can be costly in terms of both time and community image.

At this time there is no recognized accreditation or certification process associated with the provision of RET services. RESNA is attempting to address this need, along with preliminary work on the establishment of curricula that will become part of undergraduate and postgraduate training programs.

Determining the required qualifications to fill specific positions is often a difficult part of the recruiting process. Obviously, qualification in one's basic discipline is an important starting point. However, qualifications as an engineer or electronics technician does not qualify someone to provide the technical component of an RET service. Ideally, candidates should have experience working with disabled people. Failing this, a working experience as part of a multiple disciplinary team, with a keenness for learning and solving people-related problems, are good prerequisites. The "egg head" technologist who prefers to work alone does not usually do well in an RET service delivery environment. Also, most therapists or physicians do not have formal training in RET service provision. Again, this is a special interest area that must be pursued and mastered largely on the basis of self-initiative at this time.

Recruiting the RET Program Director

As suggested above, a very early development in the plans for an RET service program should be the recruitment of a capable director. This will probably be a difficult task, since experienced people are difficult to find. An alternative is to find a person that has some of the prerequisite skills and then invest in their further training. This latter approach will probably add approximately one year to the development and implementation of the start-up phase of the program. The key question that immediately arises is whether the basic training and experiences of the director should be in rehabilitation engineering. The answer to this question is not altogether clear. It is based on many factors, most of which are unique to the type of service visualized and the environment in which the program is intended to function (type of model).

As we will discuss further in the following subsection, there are basically three types of services being provided: 1) information services; 2) evaluation and information; and 3) evaluation, information, and technical services. If the scope of the intended services is limited to (1) or (2), there is usually little need to have a director

with formal technical training. It is more important to have a person well grounded in clinical skills related to evaluation, client contact, and knowledge of commercially available options. In these cases a professional with formal training in rehabilitation and with a demonstrated experience in technology would be a likely candidate for the director's position.

However, if the intended scope of the service is to include modification of commercial products or the design and development of unique devices, then engineering expertise would be highly desirable. This engineering experience becomes even more important if liaison with research programs is planned, direction of increasing numbers of technicians is visualized, and professional responsibility for quality and safety control issues are anticipated. An experienced rehabilitation engineer can provide this added technical dimension. It can be argued that these above engineering services can be made available to the program by hiring a part-time rehabilitation engineer that does not serve as the program director. This is true, but the reality of the financing, especially in a university setting, is usually that the engineering involvement cannot be paid for unless the engineer also serves as the project director. Individuals with technical qualifications in prosthetics and/or orthotics (P&O) may also be suitable candidates.

Again, it is stressed that the direction taken should be dictated by the program plans, constraints, and the availability of experienced candidates. Even more important qualifications for the director are that he or she have demonstrated management skills and a sincere commitment to function as a team leader in a multidisciplinary RET service environment. Without these latter skills, the program director is not likely to realize the development goals of the new program, regardless of their primary discipline or professional experience.

Facilities

The size and type of facilities required are highly variable and largely dependent on several factors. These are the volume and nature of the services to be provided, the growth projections for the program, and to what extent the space can be shared with other services. In general, facility requirements are usually underestimated, often inadequate even when the program first begins, with no logical plan for expansion with increased demands. Oddly enough, the need for adequate storage space is the requirement most often overlooked.

It is difficult to provide specific facility guidelines when there are so many variables, especially when compounded by the multiplicity of models. The approach taken has been to formulate space requirements based on data and historical information gleaned from a detailed survey of 15 existing programs representative of the 7 service delivery models. With this information, a new program developer should be able to determine facility requirements to meet a specific situation using the following recommendations as a point of reference and departure.

Table 3-1 contains summarized data taken from the survey information on the 15 exemplary programs. A more detailed breakdown on each program may be seen in the final section of this chapter. The space information in Table 3-1 (*Summary Space and Staff Ratios*) for each activity (*Type of Space*) was derived by taking the square footage that was reported from each of the programs. Listed are the actual squarfoot values as well as the preferred space which is based on current need. Next to the square-foot (sq. ft.) values are square foot per client per year values. It is perceived that new program developers can then determine space requirements by multiplying the ratio values by the number of clients projected for their new program. It is suggested that the number of clients projected for Years 3 to 5 be used, rather than Year 1. It should also be noted that a majority of the survey respondents indi-

SUMMARY SPACE AND STAFF RATIOS

Ref	Facility Name	Model Type **	No. FTE Staff	Total Clts/Yr	WAITING AREA(S) sq.ft. act./pref.	WAITING AREA(S) sq.ft./clt. /yr. act./pref.	CLER./ADMINIST. sq.ft. act./pref.	CLER./ADMINIST. sq.ft./clt. /yr. act./pref.	PROF. OFFICE sq.ft. act./pref.	PROF. OFFICE sq.ft./clt. /yr. act./pref.	CLINIC/EVAL/DEMO sq.ft. act./pref.	CLINIC/EVAL/DEMO sq.ft./clt. /yr. act./pref.	SHOPS sq.ft. act./pref.	SHOPS sq.ft./clt. /yr. act./pref.	STORAGE/INVENT. sq.ft. act./pref.	STORAGE/INVENT. sq.ft./clt. /yr. act./pref.	SPACE TOTALS sq.ft. act./pref.	SPACE TOTALS sq.ft./clt. /yr. act./pref.	STAFF clients/staff /yr.
A	REHABCO (BRONX,NY)	1	24	3800	100/800	.03/.27	500/2500	.67/.83	500/1000	.67/.33	100/500	.03/.17	2000/3500	.67/1.16	6000/10000	2.0/3.3	10200/18300	3.4/6.1	125
B	MILLER'S (AKRON,OH)	1	18	1040	300/800	.29/.58	1000/2000	.96/.92	150/300	.14/.29	420/800	.40/.77	1000/4000	.96/3.85	800/3000	.77/2.8	3479/10700	3.5/10.3	58
C	REPOC/SHARP (SAN DIEGO,CA)	2	1.5	180	300/300	1.7/1.7	200/800	1.1/4.4	300/600	1.7/3.3	600/2000	3.3/11.1	1400/3000	7.7/16.7	100/600	.55/3.3	2800/7400	15.5/41.1	120
D	GILLETTE HOSP (ST.PAUL, MN.)	2 ***	10	1250	800/800	.48/.48	250/250	.20/.20	300/300	.24/.24	300/300	.24/.24	5200/5200	4.2/4.2	2250/2250	1.8/1.8	8950/8950	7.6/7.6	125
E	COURAGE CTR REC (MINN.MN.)	2	5.5	365	1000/1100	2.7/3.0	400/400	1.1/1.1	300/300	.82/.82	550/900	1.5/2.5	1000/2500	2.7/6.8	0/500	0/1.4	5500/5900	15.0/16.1	66
F	UTREP (MEMPHIS,TN.)	3	9	700	590/1000	.84/1.4	400/600	.57/.86	900/1300	1.3/1.8	560/1000	.80/1.4	840/1000	1.2/1.4	820/1300	1.2/1.8	4800/6200	6.8/6.8	78
G	STANFORD REC (PALO ALTO,CA.)	3 ***	11.5	400	300/500	.75/1.2	1300/1500	3.2/3.7	1700/2400	4.2/6.0	800/1400	2.0/3.5	3230/4000	8.0/10.0	1100/3000	2.7/7.5	8435/12800	21.0/32.0	35
H	ASSIST.DIV.CTR. (SACRAMENTO)	3	6	45	100/100	2.2/2.2	200/250	4.4/5.5	720/900	16.0/20.0	300/400	6.6/8.9	260/350	5.7/7.8	70/100	1.5/2.2	1650/2100	36.6/46.6	8
I	ASSIST.DEV.CTR. (ELIZABETHTOWN,PA.)	4	8.5	150	500/500	3.3/3.3	700/1000	4.6/6.7	1600/3500	10.6/23.3	1000/1000	6.7/6.7			4200/6000	28.0/40.0	7000/12000	46.6/80.0	18
J	WOODROW WILSON (FISHERSVILLE VA.)	4	3	350	*/100	.00/.29	250/250	.71/.71			150/150	.43/.43	1600/1600	4.6/4.6	100/800	.29/1.7	2100/2700	6.0/7.7	117
K	WARREN&ASSOC (SEATTLE,WA.)	5	2.25	75			60/	.80/	150/	2.0/					20/	.27/	230/230	3.1/3.1	33
L	MEULLER,INC (WASH.D.C.)	5	1	35	100/100	2.9/2.9	50/100	1.4/2.9	200/200	5.7/5.7	100/100	2.9/2.9	250/300	7.1/8.6	50/200	1.4/5.7	*/750/1000	21.4/28.6	35
M	REHAB TECH SER. (VERMONT)	5	3	125	300/300	2.4/2.4	100/100	.80/.80	100/100	.80/.80	400/300	3.2/2.4	700/1200	5.6/9.6	50/100	.43/.80	1650/2100	13.2/16.8	42
N	CP RES. FOUND (WITCHITA, KS.)	6	52.5	350	250/250	.71/.71	300/300	.86/.86	2500/2500	7.1/7.1	1250/1250	3.6/3.6	5000/5000	14.3/14.3	1000/1000	2.8/2.8	10300/10300	29.4/29.4	7
O	PAM (LANSING,MI)	7	8.5	2500	*	*	*	*	*	*	*	*	*	*	*	*	2100/	.84/.84	294
	AVERAGES																	15.3/22.2	77

*--AMOUNT NOT SPECIFIED OR N/A
**--SEE SEC.3.1 FOR DESCRIPTIONS OF MODELS
***--DATA EXCLUDES P&O ACTIVITIES
A BLANK INDICATES NO SPACE

Table 3-1

SUMMARY FIELD DATA--SPACE AND STAFF

Ref	Facility Name	Model Type **	% Inhouse Services	No. FTE Staff	Total C/To/Yr.	WAITING AREA(S) Present Ded./Shar	WAITING AREA(S) Desired Ded./Shar	CLER./ADMINIST. Present Ded./Shar	CLER./ADMINIST. Desired Ded./Shar	PROF. OFFICE Present Ded./Shar	PROF. OFFICE Desired Ded./Shar	CLINIC/EVAL/DEMO Present Ded./Shar	CLINIC/EVAL/DEMO Desired Ded./Shar	SHOPS Present Ded./Shar	SHOPS Desired Ded./Sha	STORAGE/INVENT. Present Ded./Sha	STORAGE/INVENT. Desired Ded./Shar	TOTALS Present Ded./Shar	TOTALS Desired Ded./Shar	% INCREASE Pres.vs. Des.
A	REHABCO (BRONX,NY)	1	50	24	3000	100/	800/	1500/	2500/	500/	1000/	100/	500/	2000/	3500/	6000/	10000/	10.2K/	18.3K/	79
B	MILLER'S (AKRON,OH)	1	50	18	1040	/300	/600	200/800	400/1600	150/	300/	420/	800/	1000/	4000/	800/	3000/	2570/1100	8500/2200	192
C	REPOC/SHARP (SAN DIEGO,CA)	2	50	15	180	/200	/400	/200	/800	/300	/600	/600	/2000	/1400	/3000	/100	/600	/2800	/7400	164
D	GILLETTE HOSP (MINN. MN)	2 ***	95	11	1250	/800	/800	/250	/250	300	300	/300	/300	1700/3500	1700/3500	750/1500	750/1500	1850/6150	1850/6150	0
E	COURAGE CTR REC (MINN MN)	2	80	5.5	365	/1000	300/1000	400/	400/	300/	300/	250/300	600/300	1000/	2500/	0/0	500/	2250/300	4600/1300	7
F	UTREP (MEMPHIS,TN)	3	95	9	700	500/	1000/	400/	600/	900/	1300/	500/	1000/	840/	1000/	820/	1300/	4800/	6200/	50
G	STANFORD REC (PALO ALTO,CA)	3 ***	99	11.5	400	/300	/500	/1300	/1500	/1700	2400/	/800	600/800	/3230	/4000	/1100	/3000	/8430	3000/9800	50
H	ASSIST DIV CTR (SACRAMENTO)	3	90	6	45	100/	100/	200/	250/	720/	900/	300/	400/	250/	350/	70/	100/	1650/	2100/	27.2
I	ASSIST DEV CTR (PENN PA)	4	1	85	150	500/	500/	700/	1000/	1600	3500	/1000	1000/			1200/3000	2000/4000	4000/3000	8000/4000	71
J	WOODROW WILSON (FISHERSVILLE VA)	4	92	3	350		100/	250/	250/			150/	150/	1600/	1600/	100/	600/	2100/	2700/	29
K	WARREN&ASSOC (SEATTLE WA)	5	5	2.25	75			60/		150/						20/		230/		0
L	MEULLER,INC (WASH D.C.)	5	20	1	35	100/	100/	50/	100/	200/	/200	/100	/100	250/	300/	50/	200/	650/100	700/300	33.3
M	REHAB TECH SER (VERMONT)	5	40	3	125	/300	/300	/100	100/	/100	100/	/400	300/	/700	/1200	/50	100/	/1650	600/1500	27.2
N	CP RES. FOUND (WITCHITA, KS)	6	75	52.5	350	150/100	150/100	200/100	200/100	2500/	2500/	1000/250	1000/250	3000/2000	5000/	500/500	500/500	7350/2950	9350/950	0
O	PAM (LANSING,MI)	7	80	8.5	2500	-	-	-	-	-	-	-	-	-	-	-	-	2100/	-	

*--AMOUNT NOT SPECIFIED
**--SEE SEC 3.1 FOR DESCRIPTIONS OF MODELS
***-DATA EXCLUDES P&O DATA
A BLANK INDICATES NO SPACE

Table 3-2

SUMMARY FIELD DATA: STARTUP YEARS 1-3

Ref	Facility Name	MODEL TYPE **	PRIMARY WORK/ CLIENT TYPES SERV.	TOTAL CLTS/YR	PRES. ANN. BGT.	PROGRAM ORIGINS Year started	Startup Invest	Staff Fte's	Space Sq. ft. @	END OF THIRD YEAR Service Income %	Other Income sources	Staff Fte's	Space Sq.ft. @	New Clients 3rd yr.	Total Clients YRS. 1-3	PROBLEM AREAS YRS. 1-3
A	REHABCO (BRONX,NY)	1	SEATING,DEVICES/ ALL AGES/CP,SCI,MR	3000	*	1948	12K	2	500	*	*	4	500	*	*	LIMITED STAFF
B	MILLER'S (AKRON,OH)	1	SEATING,DEVICES/ ALL AGES/CP,MD/ HEAD INJURY	1040	*	1976	*	2	*	50	DME	3	1000	300	400	FEE LEVEL,$SOURCES, BILLING
C	REPOC/SHARP,REHAB (SAN DIEGO,CA)	2	SEATING,DEVICES/ ALL AGES,CP,SCI HEAD INJURY	180	72K	1985	*	1	2800	100		1.5	2800	*	*	PLANNING,$SOURCES, LIMITED STAFF & FACILITIES
D	GILLETTE HOSP. (ST.PAUL, MN.)	2 ***	P&O,SEATING,COMM./ CHILD,CP,SPINA BIF., MD	1250	800K	1974	*	1.5	8100	*	*	5	8100	*	*	
E	COURAGE CTR.REC (MINNEAPOLIS, MN.)	2	SEATING,ADL,JOB MODS./ALL AGES SCI,CP,MD	365	150K	1979	GRANT	2.5	400	20	GRANTS FEES	2.5	1000	160	325	INITIAL FOCUS LIMITED FACILITIES
F	UTREP (MEMPHIS, TN.)	3	SEATING,MOBILITY ADL,COMM/ALL AGES/ CP,MD,MISC.	700	400K	1974	350K GRANT	3	10000	60	GRANT	4	10000	100	200	FINANCIAL PLANNING MARKETING
G	STANFORD REC. (PALO ALTO,CA.)	3 ***	P&O,SEATING,COMM. DEVICES/ALL AGES CP,SPINA BIF.,MD SCI	400	600K	1974	800K GRANT	3	6000	70	GRANT	13	6000	853	1885	FEES SOURCES PLANNING INITIAL FOCUS &
H	ASSIST.DIV.CTR. (SACRAMENTO,CA)	3	COMM.,ED &WORK ACCESS/INFO./ALL AGES/CP,HEAD INJURY	45	100K	1977	0	3	*	50	GRANTS	5	900	35	90	$ SOURCES,REFERRALS PLANNING, LIMITED STAFF & $ SOURCES
I	ASSIST.DEV.CTR. (ELIZABETHTOWN,PA.)	4	COMM.COMPUT. INFO/ SPECIAL ED./CP MR,MISC.	150	1M	1984	175K GRANT	3	450	0	GRANT	8	7000	150	500	LIMITED STAFF & FACILITIES
J	WOODROW WILSON (FISHERSVILLE VA.)	4	ADAPTIVE DEVICES/ VR CLIENTS/SCI, TRAUMA,CONGENITAL	350	100K	1977	0	1	500	10	GRANTS	2	500	250	350	LIMITED STAFF & FACILITIES
K	WARREN&ASSOC (SEATTLE WA.)	5	JOB MODS,COMPUTER ACCESS,/VR &WORKERS COMP./SCI,CP,PAIN	75	100K	1983	10K	1	200	100	*	1.75	200	75	200	LIMITED FACILITIES & STAFF
L	MEULLER,INC (WASH.D.C.)	5	JOB MODS,ACCESS DESIGN,CONSULTING/ SCI, BACK INJURY,VISION	35	50K	1981	25K	1	500	50	OTHER FEES	1	750	10	25	INITIAL CONCEPT, LIMITED FACILITIES & $ RESOURCES
M	REHAB TECH.SER. (BURLINGTON,VT.)	5	TECH AIDS,CONSULT./ ALL AGES/BACK PAIN, CP,SCI	125	75K	1983	1	3	350	90	GRANTS	2	1300	100	225	LACK OF PLANNING, $ RESOURCES LIMITED & STAFF
N	CP RES. FOUND (WITCHITA, KS.)	6	SEATING,COMM.,JOB MODS /ALL AGES/CP,HEAD INJURY, OTHER MISC.	350	3M	1972	50K	7	*	15	GRANTS	25	10000	200	550	INADEQUATE PLANNING, FOCUS TOO BROAD, LIMITED STAFF & FACILITIES
O	PAM (LANSING,MI)	7	ADAPTIVE EQUIP,INFO., CONSULT./ALL AGES/ ALL DISABILITIES	2500	230K	1979	*	2	600	0	GRANTS, DONATIONS	4.2	1500	550	1100	LIMITED $ RESOURCES, FACILITIES &STAFF

*--AMOUNT NOT SPECIFIED OR NA
**--SEE SEC.3.1 FOR DESCRIPTION OF MODELS
@--MAY INCLUDE SHARED SPACE
***--DATA EXCLUDES P&O ACTIVITIES

Table 3-3

cated an increased need for space. Table 3-2 gives a further breakdown of the field data indicating both actual and preferred space values, as well as dedicated and shared space. Total values for each program are given as well as an indication of the percent increase required. Table 3-3 provides early program space and client flow information which may be useful to the program planner.

Client Flow Organization

During the early phases of the program implementation the numbers of clients flowing through the program should not present a major organizational problem. However, when a flow rate of 100 new referrals per year is added to returning clients, the increasing numbers dictate a need for a organized client flow process. There are many variations that seem to work. The flow diagram in Figure 3-4 is illustrative of these basic organizational schemes currently in use in several existing programs. It is provided as a reference to assist a program planner devise the flow process that will be unique to the program being planned.

Flow process C is consistent with many institutional-based models that have medical/therapy/technical professionals participating as a team. Flow paths A and B reflect more limited services and therefore may take place in environments that do not have the full medical, therapy, technical contingent. For example, flow path A emphasizes the provision of information and referrals to other services as the main outcome, whereas flow path B reflects the provision of extensive evaluation services with recommendations being made to the referral sources or directly to consumers. It should be noted that the majority of the steps in the process are common to all three types of service paths.

The extent to which the various steps in the flow process will need to be addressed by a new program planner will depend on how much of the process will be done within the proposed program. For example, in a major rehabilitation center, referral processing, evaluations, information sharing, and clinics may be organized and carried out by existing departments.

Variations and/or expansion to the above basic flow processes can be made in order to accommodate other possibilities. For example, participation of a private DME supplier, a P&O facility or local fabrication firms in the process could complement the inhouse technical capabilities. Outreach clinic visits or evaluations could supplement inhouse activities. Cooperative arrangements with research programs or volunteer groups can provide new technologies or opportunities to offer unique solutions to individual clients, respectively.

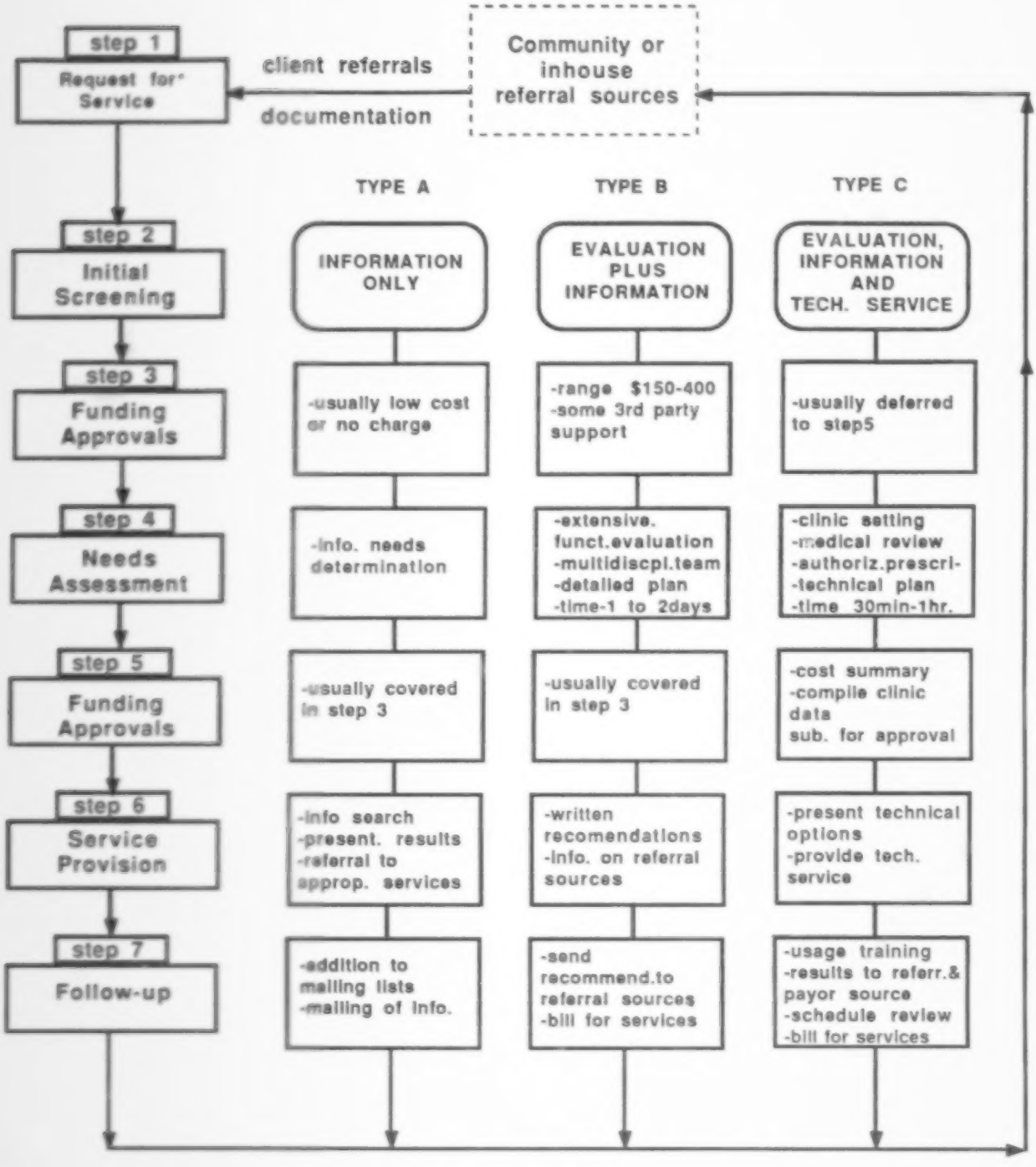
The main point is that these key steps in the process need to be identified, organized, and carried out in a coordinated manner to ensure a smooth flow of clients and the provision of quality RET services. Most existing programs are prepared to share their intake, liability release, evaluation, and cost summary forms. These can provide an excellent point of departure in those cases in which the process tools must be developed from scratch.

Client Data Base and Accounting Systems

Again, the extent to which these systems must be developed from scratch will be determined by the environment. For example, a program within a large hospital or rehabilitation center will have client data files and accounting systems in place. They will be designed to meet accepted certification and accounting practices. Therefore, the RET program will need to develop the means to effectively utilize these existing services. A nonprofit agency may be able to tie into existing accounting systems but may need to develop a client data base. A private firm will most

Figure 3-1

GENERALIZED CLIENT FLOW PROCESS



likely have to develop a complete system, probably using a commercially available data base and a computerized accounting package. Chapter Four provides general guidelines on incorporating standard business practices.

Regardless of the approach, it is vitally important that the systems be developed and tested early in the development process. Not only are they required to effectively carry out the daily business of service provision, but they are also the vital management tools that are used to monitor program results and trends, such as types of clients served, actual client flow, average income/loss per client, future client flow projections, material/labor costs, quarterly or annual profit/loss statement, etc. It is this information that justifies alteration from the original program plan and provides means for continued communication with administrators or others in financial authority. An early investment in developing an efficient client data and financial accounting system is well worth the time and expense over the long run. In the process, one also deals with the legal issues concerned with the maintenance of client and financial records.

The Fee Schedule

One of the formidable challenges that will face most new programs is the securing of consistent payment for services. The basis for this payment is a negotiated fee schedule. It is a known fact that institution-based programs often underestimate the actual costs of providing RET services. The private sector, on the other hand, has been accused of "price gouging" and that the fees charged are exorbitant. The realistic fee schedule is between the extremes, and probably closer to the private sector fee structure. The key point is that in the long run all parties stand to lose if the fees charged are either too high or too low. Unjustifiably high prices will result in less referrals, increased controls, and reluctance by third party payers to participate. Unrealistically low prices mean that the private sector cannot participate and availability of services will be limited to sponsored programs housed in large institutions. Also, there must be a critical mass of products being purchased from manufacturers and suppliers if they are to make them available on a national scale. Fee structures that do not permit purchase of the new commercial products rapidly impede the development of a key component of any delivery system – the availability of quality commercial products.

Fee schedules are based on average costs of labor plus materials plus a markup for overhead and/or profit. This formula should be worked out for a particular program based on the actual costs of the various components. For example, only a percentage, usually less than 50%, of professional staff time can actually be billed as client contact time. Chargeable technician time is possibly as high as 60% to 65%. However, the noncontact time involved in clinics, evaluations, inventory, clean up, meetings, documentation, information searches, etc., must all be accounted for in the actual cost analysis. This can be done in several ways. One common method is to assign an hourly rate to each member of the team which reflects their salary and hourly chargeable time. These rates usually range from $25 to $60 per hour. The fee schedule prices must also include the costs of staff benefits; heat, light, and power; space; and the significant clerical costs associated with record keeping, clinics, accounting, obtaining funding approvals, collections, correspondence, etc. These clerical/administrative costs can be as high as $200 per client in an institution-based program. The private sector may have slightly less overhead costs than institutions, but they must operate on a profit margin or eventually close their doors. When costs and overhead are carefully analyzed, there is little justification for much difference in fee schedules between the private sector and institution- or agency based programs.

At this time there is no recognized uniform fee schedule for RET services. Most programs have developed a fee structure with third-party payment agencies that they do business with in each state or locality. In some states, RET services have been included in the fee structure negotiated by the DME or P&O industries.

A word of caution in approaching federal, state, or provincial government insurance agencies is in order. If a fee schedule is negotiated with an agency such as Medicaid, you are not permitted to develop any other fee schedule for use with other third-party payers, e.g., private insurance companies or private clients. Also, once a fee schedule has been negotiated, it is not likely to be renegotiated for at least 18 months to 2 years. In general, standardized fee schedules and terminology/code manuals are now just beginning to develop. It is likely that the approach developed by the P&O field will be used in negotiations with agencies like Health Care Financing Administration in the United States regarding both Medicare and Medicaid clients. In Canada, health issues are more of a provincial matter, so that standardized fee schedules are being developed at the provincial level. The Assistive Devices Programs in Ontario and Manitoba are examples in at least two provinces in Canada in which fee schedules have been negotiated. For a description of the Assistive Devices Program, see the paper by P. Parnes in Planning and Implementing Augmentative Communication Service Delivery (available from RESNA). Chapter Five contains information on funding sources and strategies for obtaining payment for services. All these factors provide vital information for preparing initial and long-term budget projections and fee schedules.

External Communications and Community Relations

A vital element in any developing or existing program is to organize effective and efficient ways of establishing and maintaining ongoing communications with clients, referral sources, third-party payers, and other cooperating departments or programs within the program's service community. Since efforts in public relations often produce the least immediate or tangible returns, it is often overlooked by both new and existing programs. There are words of caution to be spoken here, quoting one new program director,

> ". . . word quickly spread throughout the community and expectations grew regarding the type of services which the Rehabilitation Engineering program would provide. When the program director arrived in February 1985 to manage the service it was expected that the Rehabilitation Engineering component would provide everything from Functional Electrical Stimulation to help persons with quadriplegia to walk again, to training robotic controlled personal care attendants in the home. A number of physicians, therapists, teachers, nurses and vocational counselors had preconceived thoughts as to how the Rehabilitation Engineering service would meet their client's needs. Needless to say, it was a bit disappointing for these professionals when they discovered that the Rehabilitation Engineering service did not have the type of exotic equipment or provide the type of service which they expected. The point to be made from this experience is that it is important to properly market a new program with services that can actually be delivered."

Even though you go through an extensive planning process, expectations develop whenever a disabled person comes through your doors. It is imperative to be honest about what you cannot do. For both new and established programs, there will be times when your only response is to admit that "I am sorry, but at this time we have no technological solution to your problem."

Investing resources in communication and community relations can yield positive returns, particularly for a newly developing program. One wants to build an expanding client referral and payment base that will serve the needs of the program in the years ahead. The primary ingredient is to develop a spirit of trust and goodwill with individuals in the referral and payment communities. This can be done in a number of ways. First of all, referring professionals and agencies should feel secure that they will not run the risk of losing their clients through referrals to an RET service program. In inhouse programs, referring professionals should be encouraged to provide input and attend evaluation sessions and clinics in order to contribute their expertise to the problem definition and solution process. Follow-up documentation (medical/therapy/technical notes) should follow the provision of the service, especially if referring individuals could not participate in the initial evaluation/clinic process. Documentation should reflect the sincere attempt to consider the needs and concerns expressed both by the disabled person and the referring professional. Periodic inservice education programs for area professionals and/or consumers can also be an effective means of communication, especially when new areas of service provision are being planned.

In the case of the DME supplier model (Type 1), in which a private facility may be providing RET services to one or more inhouse programs, community image is probably even more important. It is important that supplier personnel participate in team discussions in a professional manner. They should also be prepared to present a broad scope of technical options to consumers and referring professionals, even if it means obtaining products that are not of their standard inventory flow. Again, suppliers who are perceived as providing quality professional RET services are the ones most likely to remain participants in the service delivery systems of the future.

Communication efforts with third-party payers can have excellent results. Factual documentation and supporting medical justification, followed by photographs and other testimonial documentation, can assure third-party payers that their decisions were justified and quality service and satisfied customers have resulted. Unfortunately, these efforts can be time consuming and expensive. However, if structured into the routine paper flow, this valuable communication can happen relatively efficiently and, in general, provide greater returns than loses.

Outreach Activities

At some stage in the development of most programs there will be either an apparent or real need to extend services beyond the initial service community. For example, the initial market analysis may have identified clients just beyond the initial catchment area, that now have requested services. However, the distances are such that it is not practical for increasing numbers of clients to travel to the RET program or DME supplier. Or, a number of special education departments or developmental centers want program personnel to hold evaluation sessions or even conduct clinics within their facility. Or, a vocational rehabilitation counselor wishes a therapist or engineer to visit a worksite and carry out an evaluation and equipment modifications. Or, other facilities or private firms within your geographical area wish to start RET services and seek commitment and support to establish a satellite program. All of these requests suggest an excellent opportunity for growth with emphasis on outreach capabilities that could ultimately provide business opportunities and an array of services in locations other than the home base.

In summary, it is unclear as to how to best provide outreach services. It is clear that the nature of the service has a direct bearing on the method used to provide the service. For example, modifications to job sites in which multiple locations are the weekly norm is justification for considering a "shop on wheels." Provision of seating,

mobility, and augmentative communication services may not necessarily justify the same delivery approach. It must be kept in mind that it is very expensive to have staff travel to unfamiliar locations. Traveling time is often not recoverable and unfamiliar work locations can foster significant inefficiencies. Careful costing analysis should be given to each request and initial losses accepted only if longer term returns can be expected.

In general, the best results for clients and referring professionals will result if resources are developed within the service community in which disabled people live. The ultimate goal should be to develop self-sustaining programs or satellite RET resources that can provide the services required. The primary resource facility can facilitate the development of these new facilities through training programs, sharing of hardware developments, information, and problem solving until staff capabilities are acquired in the new program. The primary resource program can charge for their "cloning" expertise. For example, financial arrangements can be made for training of personnel and for providing the ongoing consultation and support required to establish the new program. DME suppliers may find it financially feasible to set up satellite assembly, repair, and storage facilities.

In conclusion, we will see many creative models in the years ahead in outreach development in RET services.

Program Implementation

The day has come. Staff are ready. It's time to attend your first clinic or first rounds or receive your first client or patient referral. The end result of this and hopefully many referrals to follow will probably be a commitment to deliver a specific service within a specified time frame. What can be done to optimize the chances of success as the program now rapidly becomes driven by the forces of consumer demand? The following provides suggestions and general guidelines on issues that often surface during the implementation phase of a new RET service.

Clarifying and Communicating Decisions and Commitments

Regardless of the model under which the program functions, or how complex or simplified the client flow process may be, a formal means to verify and communicate individual service plans and commitments is essential. In the more formal in-house rehabilitation model the clinic serves as a mechanism for decision clarification and documentation. The recommendations of contributing professionals are discussed and documented. The desires and needs of clients or their caregivers are also verbalized and noted. The decision resulting from the clinic interchange is formulated by the physician and recorded in the medical record. Ideally, the results are again communicated to the family by both the physician and other attending staff. Also, financial matters usually need to be discussed with clients or families by a client coordinator and realistic time expectations established. Most importantly, the documentation of medical necessity, complete with an authorized prescription, is obtained for use in securing third-party payment approvals. Copies of clinic decisions (dictations) are also forwarded to referring physicians or agencies to complete the communication loop. The end result of the process should be that all involved parties have access to a documented service plan for the referred individual which contains information on what, how, when, and for what charge.

Programs functioning with a less formal structure still have the obligation to document the service plan. However, the methods used may not be as extensive as those consistent with the more formal model presented above.

Unfortunately, some referral sources take delight in referring to a new RET program clients that have very extensive and difficult rehabilitation problems. This is particularly the case if there are already established RET resources in the community that may have already failed or refused the referral. The inclination of the new program will be to accept these referrals and expend considerable resources to solve these difficult problems. Perpetuation of this situation can very quickly lead a new program down a path of repeated failures, degenerating community image, plummeting staff morale, and financial crisis.

How can this series of events be avoided? Again, the program's original mandate and development plan should provide the basis for rejecting those referrals that are not consistent with available resources and the development goals for the program. Areas of RET expertise should be developed systematically, beginning with those that reflect a significant community need for which solutions can be efficiently packaged, delivered, and paid for. Requests for services that fall outside these established areas should be dealt with cautiously, confined to small numbers, and handled in a manner that communicates the experimental nature of the process. In other words, the "shot gun" approach to RET service development can be very hazardous, even though it will often be aggressively encouraged by many referring sources and consumers.

Information Sources

The problem has now been clearly defined and documented. The next step is to actually assemble the various elements into an acceptable solution. Where does one get information about possible solutions?

Obviously, accumulated staff experience through previous problem solving is the key source for the majority of information. However, if the program or the problem is new, or the staff are relatively inexperienced, what are the alternatives for obtaining problem-solving information? Fortunately, there have been a number of resource manuals and data bases developed in recent years. These references can provide names of commercial sources and listings of programs that are established service providers. However, the limitations of data bases are that they provide no objective assessment of the relative merits of each product listed to solve specific clinical problems. So the problem solver and the consumer are still left with selection decisions, but now at least within a finite number of possible options. In addition to acquiring the knowledge to access the above sources, an ongoing, inhouse effort is also recommended. At least one key staff person should be assigned the task of establishing a comprehensive reference file for the program. The data base should have a means of recording or referring specific consumer experiences that can be accessed by other staff or consumers. This reference file should be expanded and updated continuously as the program gets added to increasing numbers of manufacturers mailing lists and other sources of information. Subscriptions to periodicals such as Accent on Living, Closing the Gap, and Communication Outlook provide other valuable reference sources. Chapter Seven addresses the details of finding and utilizing these established information sources.

Also, many local and regional suppliers are anxious to demonstrate new products. These demonstrations should be encouraged as a source of new information for both the staff and the consumers they serve. Several equipment exhibitions take place each year which provide additional opportunities for information on new products. The RESNA Annual Conference is attended by 75 to 100 exhibitors. The National Home Health Care Expo held in Atlanta each year hosts over 2,000 exhibits on all types of rehabilitation products.

Commercial product information represents only a portion of the information that is required for problem solving. Strategies and principles related to specialized seating, powered mobility, augmentative communication, computer access, and work-site modifications all have a growing knowledge and experience base. This information must be accessed and made relevant as it may apply to the client needs of the developing program. Much of this information is not available in either resource manuals or textbooks and therefore must be acquired in other ways.

There are two primary methods for obtaining professional information specific to RET services. The most available is the instructional courses sponsored at the annual meetings of professional groups such as RESNA, Association for the Advancement of Reehabilitation Technology, American Occupational Therapy Association, American Speech-Langugae-Hearing Association, and Council for Exceptional Children. Some of these associations also co-sponsor regional educational meetings. Commercial firms are also sponsoring regional educational forums that can have broadly based educational content. A problem that can arise with new staff is that most course offerings may only be once or possibly twice a year. Also, it is sometimes difficult to acquire problem-solving details on specific client problems in a lecture-room environment. This leads to the next and probably the best source of detailed problem-solving information.

Through data bases, publications, and instructional course faculty listings one can very quickly determine which individuals are leading the field in a particular area of RET service. Many of the these established programs are willing to share detailed information with colleagues who are seriously wishing to develop similar service capabilities. Working with knowledgeable colleagues in their own work environment is the most efficient way to learn about new technologies. This direct approach, although initially costly, can save a great deal of time in a program's development phase, thereby permitting it to generate revenues in a particular service area much sooner. However, in most cases, actual provisions of the service will be dependent on securing funding from a third-party payment source.

Funding

Chapter Five addresses the broad issues related to funding of RET services; therefore, the following comments are limited to those issues that may directly effect the program development and early implementation phases. In reality, in excess of 60% or so of clients will require some form of third-party payment. Depending on the area of the country, the majority of these (40-50%) may be eligible for government sponsorship (Medicaid, Medicare, Veterans Administration, Vocational Rehabilitation, etc.). Most clients find it impossible or very difficult to complete all the paperwork themselves that is required to successfully obtain payment from third-party sources. Also, it is the policy of government agencies such as Medicaid and Medicare that one must demonstrate rejection from private insurance carriers before authorizing approvals. It is also the policy of many nonprofit agencies, such as United Cerebral Palsy and the Muscular Dystrophy Association, that one must demonstrate rejection from government agencies before they authorize approval. Therefore, this means that multiple requests to payment sources can be involved for a single client. This is all best done by a single staff person who has mastered the intricacies of paper flow. The point is that the process of efficiently securing funding approvals is complicated, time consuming, and requires knowledgeable personnel with good communication and clerical skills. One should anticipate that as more and more clients are added to the active file, the effort required to process referrals and funding approval paperwork will greatly increase. In fact, it will probably require a full-time person within three years, if not sooner.

Time delays resulting from the processing of funding requests can be significant. Most claim-reviewing personnel are unfamiliar with the RET field and funding rejections are often made for that reason. Also, additional supportive documentation may be required as part of a second request. In general, it is important that consumers and referral sources realize the time delays that can result for reasons beyond the direct control of the program. It is suggested that a means be developed for documenting the time period required to receive funding approvals after the submission of the initial request. This should be communicated to consumers and others so it will not negatively reflect on the program itself.

In summary, securing of funding approvals is often a complex and time-consuming part of the process. It can be made more efficient by having knowledgeable persistent, and thorough staff involved in the process. Clinical information that clearly spells out the medical justification and proposed solutions can reduce the time and rejection rate. Honest communication with third-party authorizers can build the confidence and relationships necessary to further expedite this critical part of the process.

The Provision Decisions

In the majority of cases, the needs evaluation will result in a plan that includes the provision of one or more technical aids. The decision to accept a technical challenge must be carefully made. It must be based on the knowledge of what currently exists technically (commercially) that can be used without modifications, what current technology can be readily modified to do the job, and what solutions must be custom designed and fabricated as a last resort. A rule of thumb is that no less than 60% should be commercial, standardized products, 30% modified commercial products, with no more than 10% custom-designed products. If the combined custom designed and modified commercial categories exceed these percentages on a regular basis it will be difficult to deliver timely services at a rate that will maintain referral and consumer satisfaction, and cover actual costs, including overhead margins.

Quality Assurance and Legal Issues

As the new service matures, the probability of having to deal with legal liability issues begins to increase. When a program recommends a commercial product without any modifications to the basic design, chances of acquiring legal responsibility for its malfunction or injury to a client is relatively small. However, once modifications are carried out, and certainly in the case of unique designs, the possibility of malfunction which can lead to litigation becomes a serious consideration. How is this issue managed throughout the field? The facts are that most non-physician professional personnel in RET service have some form of liability insurance. Most physicians have to carry insurance for other reasons. Therefore, if the service provided is done under the written direction of a physician this may offer some element of umbrella protection for other people working under the physician's direction. Private consulting therapists may have liability insurance through their professional associations. The majority of individuals rely on the legal backup of their employer or firm to provide the litigation coverage if it is required. This is not an ideal situation in most cases, but a risk that most professionals are prepared to take.

How can one minimize the risk of liability suits as the program is being developed and implemented on a daily basis? Legal opinion has not been sought on the following suggestions. However, the practices described have served many individuals well throughout the last 15 years, during which time many programs have been under active development.

The key to minimizing the chances of legal involvement is through providing services of high professional standards. If one employs standards of evaluation, provision, documentation, and follow-up that are of accepted professional standards throughout the rehabilitation field, there should be little reason to fear litigation. If and when problems do arise, they should be managed in a professional way during which time appropriate corrective action and documentation takes place. A problem must not be ignored with the hope that it will fade away. Rather than withdraw from a problem, it is suggested that providers work more closely with any clients in difficulty in an attempt to honestly rectify the situation. If one senses an imminent liability suit, one should reintensify the effort to document all events and seek legal council.

Many institutions have clients sign liability waivers prior to receipt of services. Although this may have some value in litigation proceedings, it certainly does not remove liability if malpractice can be demonstrated. There is really no substitute for providing quality professional services which have been documented and can be shown to be the state-of-the-art. Some programs assign specific staff members the added responsibility of quality assurance checks in order to minimize the possibility of problems occurring.

Billing and Collection Realities

Services have been provided. A challenge that remains is to actually receive payment for the services rendered. Chapters Five and Six deal with recommendations related to establishing accounting systems, as well as strategies for obtaining funding approval, respectively. This section deals with the realities of collections (accounts receivables) that may affect the policies, procedures, and budget projections for the program that is entering its early implementation phase.

Don't be surprised when you find out that a prior approval granted by an insurance company or Medicaid does not really mean that they guarantee to pay the amount approved. The fact is, they will pay the full amount in 80% to 90% of the cases.

Don't be surprised when an insurance company refuses to reassign a client's benefits to your agency or firm as payment for services, and insists on sending the check directly to the client. This is simply the policy of many insurance carriers and there is really not much you can do about it.

Don't be surprised when Mrs. Jones spends the insurance payment on a fur coat rather than paying for the services provided. This is a reality that results in about 5% to 10% of none or partial payments.

Don't be surprised when after the third overdue notice a client calls up and says that the device provided nine months ago has never worked and you can come and pick it up because they don't feel they should pay for something that has never worked.

Don't be surprised to find out the collection agency wants at least 40% of anything they collect.

Don't be surprised when you have taken six months to figure out how to bill a major insurance carrier without a high rejection rate, when they then decide to completely revamp the billing procedures.

Don't be surprised when a major insurance carrier wishes to pay for your services over a 12- to 18-month rental period versus a "lump" upfront payment.

The point of presenting these actual scenarios is first to indicate that there are realities in the marketplace that will only become apparent after implementation of the program. Second, uncollectible receivables will result in annual write-offs ranging from 10% to 15% of gross billing. This needs to be factored into budget projec-

tions. Finally, one needs to develop standard policies for addressing situations of returned devices, nonassignment of insurance benefits, collection agencies, etc. It is important to have these policies in place so that front-line staff can inform consumers accordingly early in the provision process. Not having written policies, particularly related to financial management, makes it difficult to take appropriate action after the fact.

Alterations, Maintenance, and Repair Policies

In the development of most RET programs, one must address the issues of ongoing maintenance and repair. It is vitally important that a source be made available through which consumers can have equipment adjusted, maintained, and repaired as required. This can be fairly straightforward when the individual consumer is purchasing the services. However, it becomes more complex when third-party insurance payers are involved. The issue usually becomes one of time required for prior approval for repairs when the need is urgent. Or, the extent of the repairs required are beyond the amount that will be authorized by the payer. Also, the paperwork involved in minor repairs can be more costly than the repairs themselves.

Several options can usually be worked out to best meet the needs of all the parties involved. First, some fee structures include one follow-up visit for minor alterations within a specified time after provision of the initial service. This cost is built into the initial purchase price. This approach usually works well since it gives the consumers an opportunity to ask questions or provide input after having used the device for a period of time. It also gives valuable feedback to the service provider as to any problems that may be occurring. Nonuse of the device is also detected at this time. Another approach is to work out prior arrangements with third-party payers for repair payments up to X dollars without individual prior approval. This works well but must be based on a high level of trust between payer and provider. Another method is to establish a schedule of maximum repair charges which can be authorized by telephone as required.

Basically, there can be any number of approaches to facilitate the efficient provision of maintenance and repair services. However, these policies should be worked out with third-party payers early in the development process so that efficient services can be provided as the need arises.

Management Skills

It is not readily acknowledged by most administrative structures that the most valuable asset within any agency, facility, or firm is its qualified staff. Without them the program or service would cease to exist. The following are a succession of thoughts that are arranged in point format which may prove useful to a person that is suddenly confronted with the challenge of supervising other people; possibly for the first time in their career. The concepts have been drawn from a variety of sources with the intent to make them relevant to ongoing staff relations in RET services.

On Recruiting:

- A person's past is still the best prediction of his or her future. A manager's role is not to change people, but to identify those who can accomplish the results within the constraints of the resources and environment.

- The work of RET services does not wait to be done by perfect people. Be aware of "superstars;" they can consume 80% of the resources, create 90% of the hassles, and produce 10% of the effective results.
- In a service setting, natural ability without formal education will more often yield positive outcomes than education without natural ability.
- The easiest part is to hire - the hardest is to fire.

On Delegating:

- It marks a big step in a program's development when the director realizes that others can be called on to help him/her do a better job than can be done alone.
- No leader or supervisor has ever suffered because their subordinates are strong and effective.
- It is better to have a person working with you than three people working for you.
- To successfully delegate one must clearly communicate the task to a competent person who has the motivation to accomplish the results expected.
- Delegation without authority is like a technical aid without the ability to use it - one gives meaning to the other.
- It is a sign of good leadership when your staff can function without you.

On Motivation:

- A person always has two reasons for doing anything - a good reason and a real reason. The real reason will be the result of their inner needs.
- It's safe to assume that most people want to feel the satisfaction of doing a good job. Create the environment and the expectations and most people will be motivated to produce rewarding work.
- The improvement of a person's value to both themselves and the program is both a matter of material advantage and moral obligation.

On Creating the Team Spirit:

- A group becomes a service team when all members are sure enough of themselves and their contribution to praise the skills of others.
- A service team will rarely be successful in the long run unless it can have some fun along the way.
- Most team members want to be appreciated not impressed. They want to be regarded as equal members, and not as mere sounding boards for other people's egos. They want to be treated as ends in themselves, and not as means toward gratification of another's vanity.
- Be kind to your colleagues. Remember everyone is fighting a hard battle in one way or another.
- Somehow we must make room for inner-directed, obstreperous, creative people, sworn enemies of routine and the status quo, who are always ready to upset the apple cart by thinking up new and better ways of doing things.
- A person who seeks your advice too often is probably looking for praise rather than information.

On Use of Time:

- One of our greatest illusions is that there will be more time tomorrow to do the things we really want to do than there is today. Procrastination is the greatest thief of time.
- Nothing else, perhaps, distinguishes effective people as much as their tender loving care of time.
- Time spent does not necessarily equate to time well spent.

On Creating Change:

- In our haste to deal with things that are wrong, let us not upset the things that are right.
- Most people will positively support change if they can perceive:
  - that a problem or opportunity truly exists
  - they can analyze how the change will effect them,
  - they feel that the change is a positive development for the program or themselves,
  - they feel a dissatisfaction with the "status quo."

  It is the leader's role to communicate and establish these perceptions prior to initiating change.
- Most people prefer change in small increments rather than in giant steps.
- It is the leader's role to determine the size of the increments, and their timing and number.
- When change is successful, look back at it and call it growth. When it's unsuccessful, call it experience.

On Patience and Perseverance:

- Some things simply take time.
- A good follow-through is just as important to RET management as it is in bowling, tennis, or golf. Follow-through is the bridge between ideas, planning, and good results.
- Success is largely a matter of percentages. If you keep on swinging, sooner or later you are bound to get some hits. The courage to keep on plugging is what places the odds in your favor.

On Keeping Focused:

- Getting things done is not necessarily the same as doing things.
- Recognize that the majority of what needs to be done is really not that important. Only a small percentage of things are really crucial for the success of a program.
- Recognize that we tend to do those things that make us feel good. Unpleasant things we tend to avoid.
- Keep your "eye on the road." If you let all the little daily trifles and irritations consume your energies, you will never reach the ultimate goal.
- You can tell when you are on the right track – it is usually uphill.

On Attitudes:

- It has been said that there is very little difference in people, but that difference makes a big difference. The little difference is attitude, the big difference is whether it is positive or negative.
- People are often down on what they are not up to.
- All people respond to specific situations in different ways. This response is usually ingrained and involuntary. It is the source of one's attitude.

On Maintaining Balance and Continuity:

- The Mack Truck Theory says that any member of a program can be suddenly and permanently lost. Job rotation, overlapping, and documentation are means to minimize the effects of this event.
- It's human nature to have our personal preferences, likes and dislikes. These traits can get in the way when managing people and resources, where equality and balance are the goals.

On Resolving Conflict:

- In spite of one's effort to create a problem-free environment, don't be disillusioned if staff and client discontent are the daily norms. No slugger bats a thousand.
- Only about 50% of the conflicts resolve themselves; the remainder can't be ignored.
- To err is human. To blame it on the other guy is even more human.

On Leadership:

- A good example is a lesson anyone can read.
- A prime function of a leader is to keep hope alive.
- The real challenge is to use the minimum effort and resources to achieve the maximum result.
- Small opportunities are often beginnings of significant achievements.
- Leaders need to have their staff tell them their bad qualities; it is only the particular ass who does so that we can't tolerate.

On Perfectionism and Taking Action:

- Strive for perfection but accept 80%.
- One never has all the facts necessary for the best decision making.
- A second best decision quickly made and vigorously carried out is better than the best decision too late arrived at and half-heartedly carried out.
- Decisions to be made in taking action are:
  - Is it within the goals of the program/firm/institution?
  - What is to be done?
  - Who is to do it?
  - How should it be done?
  - When should it be done?

  and

- Where should it be done?

On The Natural Lifecycle:

- All programs and activities seem to have natural life cycle of about five years, after which time they need revitalization if they are to continue to grow.

On Saying Good-Bye:

- It is the hallmark of our society that people can pursue new and better opportunities. When that time comes, shake hands and wish them well in their new adventure.

Performance Evaluation

At an early stage in the development of a RET program the director and others responsible for its administration will need information which can be used to evaluate the program's performance. Basically, there are three sources of data that can be accumulated and analyzed to generate the information required: client statistics, financial analysis, and community feedback. Methods should be developed and implemented at an early stage to collect and analyze this vital management information.

Client statistics can provide direct information on rate of annual growth; types of clients/services provided; average number of clients per week/per month; percentage of cancellations or "no shows;" number of clients per clinic; annual peaks and valleys; and future work based on client waiting lists for funding approvals, medical information, clinics, and provision of technical services.

Financial information is of course related to client flow, but provides monthly and annual income and expenditures statements. More detailed breakdowns can show average charges per client and information where actual income and expenditures are occurring. The combination of both client flow data and financial information can be used to generate profit/loss statements and projections for year-end analysis. All this information is vital for planning of resource reallocation and making decisions on new staff, space, and equipment acquisitions. It is also the means by which the program director can communicate the status of the program's development to bankers or other financial administrators. It is the objective basis for taking any systematic corrective action that may be required, or significantly deviating from the initial development plan.

Community feedback is the third key source of valuable information that can be used to evaluate a program's performance. This information is more difficult to obtain and therefore is often not done. The information is also largely subjective and therefore must be obtained and analyzed carefully.

In general, one wishes to know how well the program has been meeting the expectations and needs of consumers, referring professionals, and third-party payers. The most effective way to solicit useful feedback is to communicate an open and sincere desire to want to know what problems consumers may be having with your services. The referring professional and other client advocates will often be the most candid. Consumers may be unsure of the purpose of the solicitation and are therefore less likely to give frank responses to staff queries. Carefully structured consumer questionnaires can be a useful method if administered in a nonthreatening manner. Another method is to establish a consumer advisory council that can be a semi-independent vehicle for collecting and communicating consumer concerns.

Direct telephone calls and questionnaires administered by staff to referring agencies and professionals can also be effective.

Regardless of one's efforts, there will always be a percentage of "problem" consumers or referring professionals. These individuals will often be very candid about the exorbitant prices being charged for services that do not meet their expectations. One should listen carefully to these direct "broadsides" and analyze whether they are truly complaints from habitual malcontents, or whether they are an outcry from the "tip of the iceberg." In conclusion, one needs to objectively monitor the status of the program's community image so that corrective action can be taken as necessary.

Good relationships with third-party payers is also crucial. Most simply want to be assured that recipients are receiving quality services. Many third-party payers have inspection personnel who review the quality and nature of the services provided. Work closely with these individuals and respond appropriately to their expressions of concern related to individual consumers. They expect you to be honest, open, and thorough in your dealings with them. If you are, there can be no justification for third-party payers to treat payment requests for your services in any other manner. Direct relationships built on trust and mutual respect will create the image necessary for continued support, feedback, and involvement by third-party personnel.

Models from the Field

Introduction

In order to present a broader view of new program development than we alone can give, we solicited input from others who have had experience in starting new service programs.

In this section we have summarized their comments. On our suggestion, respondents, in most cases, provided approximate answers to our questions regarding program budget or facility square feet, etc. Time constraints limited the number of program founders we could poll.

Program Origins and Development

Although the limited number of programs sampled vary even within the seven models or categories, some share common elements of origin and development.

Program Origins

Five of the programs (programs C, E, F, G, J) classified as Model types 2, 3, and 4 were initiated by a director or a physician in a rehabilitation facility/hospital. (See Table 3-1 for the correspondence of programs and number/letter codes, and for program information.)

Initiators of these programs, and of another Type 4 program, hired an experienced rehabilitation technologist to implement and direct the program (programs C, E, F, G, I, J). The three Type 5 entrepreneurial programs were also begun by experienced rehabilitation technologists (K, L, M).

All but one program (N) began with more than three full time employees. Funding for program start-up varied widely. Three programs began with virtually no funding (H, M, O), while others, with over $100,000, were more fortunate (F, G, I). Initial floor space ranged from 200 square feet (K) to 10,000 square feet (F), with eight programs having less than 700 square feet (A, E, I, J, K, L, M, O).

Program Development by Year 3

By the end of the third year, program staff sizes at least doubled for seven programs (A, D, G, I, J, N, O). All but one, M, increased its staff size. The average staff growth factor was 2.0.

Though 14 out of 15 programs increased staff, floor space increased for only 6 programs (E, H, I, L, M, O). With the exception of Program I the average floor space growth factor was 1.6.

As expected, the number of clients seen per year increased as the new programs became established. Six programs saw between 50% to 75% of all the clients they had served in the third year (B, E, F, H, J, O).

Problem Areas Encountered in the First Three Years

Eight program founders reported that their program's initial focus and/or planning could have been improved (C, E, F, G, H, L, M, N). Eight desired more space (C, E, I, J, K, L, N, O). Seven needed a larger staff (C, H, I, J, K, M, O), and three reported weakness in the other staff-related areas (A, F, N). For five programs, both space and staff were limited (C, I, J, K, O).

Program funding/financial management issues were problems for four programs (B, L, M, O). Access to payment sources was difficult for five (B, C, G, H, N).

Recommendations for Building New Programs

Five founders advised starting small with a limited number of services (C, D, E, G, N). Three advised market research efforts (H, K, L). Three people mentioned the importance of running the program as a business, avoiding the impulse to give away services (B, K, N). Two advised establishing good accounting procedures (K, N). Program funding and payment sources advice included three recommendations to secure adequate capital (I, L, M) and three recommendations to know and develop payment sources (C, H, N). Three suggested development of broad community contacts and referral sources (C, G, O). (See the next section for further information and more specific comments.)

Reflecting the fact that many programs reported being short staffed, three people advised hiring dedicated, "can do" coworkers (H, M, O).

Models from the Field:
Case Studies of Program Origins and Development

Type 1: DME Suppliers

Program A: Rehabco

Contact Person: Jeff Offner
Rehabilitation Equipment, Inc.
2811 Zulette Avenue
Bronx, New York 10461
(212) 829-3800

Rehabco is a durable medical equipment supplier (DME) in Bronx, New York, also serving the downstate New York population of 7 million. In addition to traditional DME sales, Rehabco provides seating and positioning services for approximately 3,000 clients a year, most of whom are children and adults with cerebral palsy,

spinal cord injuries, and mental retardation. Seventy-five percent of the services are in the form of technical evaluation and fabrication, with the balance being education, consultation and other activities. Half of the services are provided inhouse. Staff for all operations totals 24 and includes an occupational therapist, physical therapist, and a rehabilitation engineer. The facility has 10,200 square feet of floor space. Operating expenses are wholly covered by fees-for-service.

Program Origins

Ed Offner, father of the present director, Jeff Offner, began the company in 1948 and provided what must have been one of the first custom seating services for people from local hospitals with conditions including polio and head trauma. Two people, one doing sales and fittings, the other working in the modest 500 square feet facility, began with start-up funds of $12,000.

Evolution Years (1-3)

No change in focus occurred during the early years. Two more staff people were added.

Problems Encountered

The reason for beginning the program, program planning, and initial focus proved to be successful. Greater success may have been realized with a greater cash flow and a retail location for the facility, which would have yielded greater diversity and more stability. Also effective would have been closer ties with hospital administrators rather than with medical directors. Staff was a problem, though a common one in such a competitive job market.

Advice for Building New Programs

Jeff advises: "Wait until funding is increased on a national level or run the program without regard for profit. Dealerships are currently in great jeopardy due to shrinking profits and increased operating expenses."

Program B: Miller's Special Products Division, Miller's Rental & Sales

Contact Person: Jody Whitmyer
Miller's Specialty Products Division
284 E. Market Street
Akron, Ohio 44308
(216) 376-2500

Miller's provides assistive devices and education for adaptive intervention and distributes original equipment manufacturer's (OEM) products through a network of specialized dealers in 19 cities (total population 4.5 million). Clients of all ages are served, although a large percentage tend to be school age children. Last year a total of 1,040 clients were seen, 200 of whom were new clients. The three most common disabling conditions addressed are cerebral palsy, muscular dystrophy, and head injury. Technical evaluation and fabrication of adaptive seating is the main focus, with some work done in the area of specialized powered mobility.

A staff of 18 includes a manager/product developer, 2 occupational therapists, and 8 technicians. Facilities include 8200 square feet of work space and two mobile shop trailers which allow 50% of the services to be provided off site. The operating bud-

get is 90% fees-for-service: Medicaid (60%) and major medical insurance plans (30%). Donations account for the remaining 10%.

Program Origins

In 1976 John Miller, president of Miller's Rentals and Sales, began the Specialized Product Division because conventional DME methods were not suitable for providing custom modified equipment. John Miller and Jody Whitmyer, the division manager, pursued a trial-and-error approach of program implementation working with concerned occupational therapists and physical therapists in northeast Ohio. Referrals came as a result of working with special schools, community therapists, and long-term care facility staff. Division staff consisted of John conducting client evaluations, and Jody fabricating simple seating equipment in a small, simply outfitted shop.

Evolution Years (1-3)

By 1979 they were seeing 300 new clients/year with a total of 400 served. Most of the clients were mentally retarded or developmentally delayed with orthopedic involvement requiring specialized seating. Facilities included 1,000 square feet of workspace and $3,000 of equipment. An additional staff person was hired to help with seating fabrication. Half of the operating expenses were covered by fees-for-service, the balance by the parent company.

Problems Encountered

The reason for beginning the program, staff, and working with key community people and facilities were successes. The mobile shop decreased the need for elaborate inhouse facilities, enabling use of resources available at the facilities served. Initial problems with underestimating time and resources required to provide a device might have been minimized had there been a greater emphasis on time management and a better understanding of funding and billing procedures.

Advice for Building New Programs

Jody suggests the following key factors to build a successful program:

1. Community-based contacts as opposed to a clinic setting. Benefits include:
   a) availability of input from a variety of disciplines;
   b) clients evaluated in their own environment; and
   c) flexibility in scheduling.
2. Rely on end product users to define problems and measure success of equipment provided.
3. Hire staff who are mechanically inclined with the ability to communicate and creatively problem solve.
4. Streamline services as a business to ensure the ability to continue providing services.

Other suggestions include:

- "Be prepared to offer follow-up services in a timely fashion and with the same level of enthusiasm as accompanied the first encounters."

- "Utilize available resources to the fullest: Too often time is spent 'reinventing the wheel' when products or services are just around the corner."
- "Invest in training employees rather than educating them thru a trial and error approach."

Type 2: Department in Comprehensive Rehabilitation Program

Program C: The Rehabilitation Engineering Prosthetic/Orthotic Center (Associated with Sharp Memorial Hospital)

Contact Person: Ken Kozole
Director Rehabilitation Engineering Services
Sharp Memorial Hospital
5466 Complex Drive
San Diego, California 92123
(619) 292-2942

This program in San Diego provides seating, mobility, and work site modification services to both children and adults in San Diego County (population one million). Typical clients are head injured, have cerebral palsy (CP) or have a spinal cord injury (SCI). Fifty percent of the work done is in the form of clinical therapy services, 25% technical evaluation or fabrication, and 20% consultation. Half of the services are provided inhouse. A rehabilitation engineer (B.S., M.E., OTR) and a shared orthotics technician share 2,800 square feet with prosthetics and orthotics activities. The annual budget for the rehabilitation engineering services alone is $72,000.

Program Origins

The medical director of the Sharp Rehabilitation Center had the initial concept for the program. Rehabilitation center administration believed it would enhance available patient services and, along with the director of occupational therapy, helped in program planning. In 1985, after four months of preparation, services began with the initial focus being seating for the rehabilitation center's SCIs, CPs, head injuries, and CVAs. Working relationships were also established with the local Regional Center, a rehabilitation facility for children, UC San Diego Medical Center, Children's Hospital, and the UCP Center.

The new program shares existing prosthetics and orthotic facilities, staff, and revenue base. Ken Kozole, a rehabilitation engineer and a registered occupational therapist, was hired as the director.

Evolution Years (1-2)

The program's initial focus remained unchanged. Operating expenses were covered by fees-for-service.

Problems Encountered

Program planning could have been improved by establishing a planning team with therapy departments to determine their needs and negotiate referral and billing processes, thereby avoiding unintentionally "stepping on their toes." Being the director and the rehabilitation engineer and the fabrication and the funding expert, Ken has had difficulty devoting the necessary energy to the time-consuming job of reimbursement for services, including establishing contacts with Medicaid and Medicare. He could have used another staff person to handle reimbursement, managerial, and

administrative duties. Another rehabilitation engineer and a full-time technician with electronics training are presently needed. The existing facility is 50% too small and is four miles from the Sharp Rehabilitation Center, the primary referral source. A facility at the Rehabilitation Center would eliminate a great deal of transportation time and expense.

Advice for Building New Programs

Ken offers the following suggestions:

- Have a service plan which coordinates with existing structures. Start building a foundation by offering visible services for which payment is available on a fee-for-service basis. Do not try to do too much, "do all for everyone."
- Know what can be billed for and who will pay for the services.
- Hire enough capable, full-time employees.
- Try to locate program facilities near the main referral source; possibly consider a mobile shop.
- Educate payment sources about rehabilitation engineering services and how they differ from traditional rehabilitation services. Be prepared to write many letters of justification.

Program D: Habilitation Technology Labs, Gillette Children's Hospital

Contact Person: Martin Carlson
Gillette Children's Hospital
200 E. University Avenue
St. Paul, Minnesota 55101
(612) 291-2848

The program provides mostly inhouse technical evaluation and fabrication services in the areas of orthotics and prosthetics, seating, adaptive equipment, communication, and mobility control to predominantly young clients with cerebral palsy or spina bifida, living in Minnesota and adjacent areas.

The staff of 10, including four orthotic technicians, one electronics technician, one designer, and one rehabilitation engineer organized into a four-person sitting support team, and a five-person adaptive equipment team, occupies an 8,100-square-foot facility, 1,700 square feet of which is dedicated to rehabilitation technology services (excluding P&O). Eight hundred thousand dollars of the 1.85 million dollar annual budget is derived from fees for rehabilitation technology services.

Program Origins

Martin (Marty) Carlson, a CPO with an M.S. degree in mechanics and materials, developed the program within Gillette's existing Orthotics/Prosthetics Department in response to community need expressed by therapists at local schools and extended care facilities. The program started in 1974 with profits from the P&O Department as start-up funds. A designer was hired as the first staff person.

Evolution Years (1-3)

Most services provided involved seating for children with cerebral palsy. Most equipment and facilities were shared with the P&O Department. By the end of the third year the staff had increased to approximately five people.

Problems Encountered

Marty rated all aspects of the program successful. Program planning involved justifying new staff by work volume and annually projecting growth rates. Although it has not been a problem, the program had no initial mission statement due to the gradual nature of program outgrowth from the P&O Department.

Advice for Building New Programs

Marty suggests:

- "Start with a plan and/or realization that [the program] should be self supporting as soon as possible."
- "Start small, not big."
- "Grow the rehabilitation engineering program out of the P&O operation."

Program E: Rehabilitation Engineering Program at the Courage Center

Contact Person: Ray Fulford
Rehabilitation Engineering
Courage Center
3915 Golden Valley Road
Golden Valley, Minnesota 55422
(612) 588-0811

The program provides direct client services in the areas of seating, aids for daily living, jobsite adaptation, computer awareness, and information and referral. In addition, the center works with local government and industry to promote the application of technology for people with disabilities. Their client population tends to be adult spinal cord injured, although they do serve children and clients with cerebral palsy and other neuromuscular diseases. Most clients live in the 4 million population catchment area of Minneapolis/St. Paul/greater Minnesota. Fifty percent of staff time is spent doing technical evaluation, fabrication, and adaptation, with the balance spent doing consultation, education, research, and delivery. The staff, a rehabilitation engineer, electrical/computer technician, seating technician, two volunteer technicians, and one part-time secretary, have approximately 2,000 square feet of work space. Half of the $150,000 annual budget is provided by fee-for-service billing, the remainder from grants and general organization support.

Program Origins

The director of the Courage Center, a comprehensive rehabilitation facility, had the initial concept that a rehabilitation engineering service program could help fulfill the needs of a new transitional residential facility. In 1979, a committee consisting of handicapped individuals and technical people from local corporations guided by a staff case worker and a subsequently hired director, rehabilitation engineer, Ray Fulford, did the work of planning and program implementation. The initial program mission was directed toward the independent living and educational needs of those over 18 years of age, with a strong focus in assistive device development. The first clients were referred by other Courage Center programs.

Initial resources included a few pieces of machine shop and electronic equipment squeezed into 400 square feet. The staff consisted of Ray, hired as a result of a national search, an electronics/computer technician, a part-time secretary, and shared

staff from the inhouse occupational therapy program. Start-up funds were provided by a private foundation grant.

Evolution Years (1-3)

By 1982, the program was seeing 160 clients a year having served a total of 350. Services included aids for daily living and worksite modifications for adults, primarily with spinal cord injury or cerebral palsy. An initial suggestion that the program focus on product development and production was changed to a focus on direct service provision. Resources included $20,000 of mostly donated equipment and 1,000 square feet of space. The staff size remained the same. By the end of the third year 15-20% of operating expenses were derived from fees-for-service, 30% from grants, and 50% from a general Courage Center operating budget.

Problems Encountered

The reason for beginning the program, staff, and working with key community people have been successful. Building supportive working relationships with other Courage Center programs has leveraged the efforts of the small staff. Program planning and the initial program mission to develop products, formulated without knowledge of rehabilitation engineering, was too narrow. Once hired, it took Ray two years to reorient the program to one of direct client services. Although funding was generally adequate, floor space was tight.

Advice for Building New Programs

Ray suggests three key factors essential in starting a successful program:

1. A solid committed funding source to underwrite the program for several "start-up" years.
2. Cultivation of a broad community referral base or base of support for the program.
3. Delivery of a quality product and ensuring that the client is satisfied.

In addition, he recommends that a program attempting to provide a range of services focus on one service provision area as a primary revenue source.

Type 3: Center in a University

Program F: University of Tennessee - Rehabilitation Engineering Program (UTREP)

Contact Person: Douglas A. Hobson, Technical Director
University of Tennessee
Memphis Rehabilitation Engineering Program
682 Court Avenue
Memphis, Tennessee 38163
(901) 528-6445

The UTREP primarily provides specialized seating, mobility, and communication aids to children with cerebral palsy, although other technical needs and other populations are also served. The majority of clients live in the Memphis area (population 1 million) or within a 300-mile radius (population 3 million). Most work, done inhouse, consists of technical evaluation and fabrication. The nine-person staff, including two rehabilitation engineers, three technicians, and two occupational therapists, work in a 4,000 square foot facility and have access to an adjacent research building

which houses a plastic fabrication and machine shop. The annual budget of $400,000 is 100% fee-for-service.

Program Origins

Douglas A. Hobson, P. Eng., and Robert E. Tooms, M.D., orthopedic surgeon, began the program because of community need and uncommitted funds. Douglas did the six-month task of planning, and implemented the program in 1974 with the focus on aids for children. Key contacts for the new program included the Campbell Clinic, a group of orthopedic surgeons, and the local children's orthopedic hospital.

The program was provided a facility of 10,000 square feet and $350,000 as start-up funds. The initial staff included an experienced occupational therapist and orthotist and locally hired and trained technicians and clerical staff.

Evolution Years (1-3)

By 1977 the program saw 100 new clients/year having served a total of 200. It had purchased $60,000 of equipment.

Problems Encountered

There were no problems with the initial program concept or the generously large and well-equipped facilities. Program planning could have been improved by better financial projections, better planning for growth and improved program/financial monitoring systems. Marketing and community participation efforts could have been better. Staff development and training was also lacking.

Advice for Building New Programs

See the previous sections of this chapter.

Program G: Rehabilitation Engineering Center - Children's Hospital at Stanford

Contact Person: Maurice LeBlanc
Rehabilitation Engineering Center
Children's Hospital at Stanford
520 Sand Hill Road
Palo Alto, California 94304
(415) 327-4800

The Children's Hospital Rehabilitation Engineering Center provides assessment and fabrication services to people of all ages. Technical evaluation and fabrication services in the areas of orthotics and prosthetics, seating and mobility, communication and control, and prevention of tissue trauma are all services provided by the program. Evaluation services include assessment clinics both inhouse and off site. Most clients live in the San Francisco Bay area (population 6 million) with others from more distant northern California areas.

The program has a paid staff of 26 including 5 orthotists/prosthetists, 3 rehabilitation engineers, 7 technicians, an occupational therapist, a speech pathologist, 2 seating and mobility specialists, and a 20% time physician. The program facility has 8430 square feet of shared space. The annual budget is $1.5 million. The annual service budget is split evenly between public and private insurance fee-for-service payment sources.

Program Origins

Eugene Bleck, M.D., then chief of orthopedics and rehabilitation at Children's Hospital at Stanford had an idea for an orthotic center. Maurice LeBlanc, rehabilitation engineer/CP, expanded the concept to include prosthetics and rehabilitation engineering services. Impetus for establishing the program was provided by community need, personal vision, and by Dr. Bleck's increased interest and knowledge about technical solutions for orthopedically disabled children. In 1974, Maurice LeBlanc implemented the program with a focus "to help each child pursue as normal a growth and development process as possible and to help each adult reach his/her maximum potential compatible with his/her disability." Most referrals came from Children's Hospital at Stanford, Stanford Hospital, CCS Medical Therapy Units, and local Regional Centers (state programs for disabled children).

Initial resources included a new building of approximately 6,000 square feet and staff of one secretary, an orthotist/seating specialist, and Maurice, as director, acting as prosthetist and communication specialist. Dr. Bleck secured private foundation funding of $800,000, half of which was spent on the new building and equipment, the rest spent to initially fund the operating deficit.

Evolution Years (1-3)

By 1977, Children's Hospital at Stanford REC was seeing 853 new clients/year, with a total of 1,885 seen in the first three years. Eighty four percent of the clients were children, 26% of whom had cerebral palsy; 13% ankle/foot anomalies and 12% spinal anomalies. The remaining 49% of the clients exhibited one of more than 15 other diagnosis. Forty-four percent of services dealt with seating and mobility, 38% orthotics, 6% prosthetics and 11% communication and other technical aids. By the end of the third year the building contained $100,000-worth of equipment and housed a staff of 13. At the end of the third full year, fees-for-service, split evenly between private and public insurance, comprised 76% of the operating expenses with the balance covered by the start-up grant.

Problems Encountered

The reason for beginning the program, facilities, equipment, and staff proved to be successful. The financial plan, to be self-supporting in three years, was realized in four. Problems included taking critical program planning time to build and equip the new facility. More program planning and a more gradual start-up would have avoided being inundated with clients when the doors were opened and would have helped foresee problems. The broad mission statement, if narrowed in scope, might have helped reduce the rush of clients. Services should have been added one by one; new ones added only as earlier ones proved viable. More time should have been spent working with key community people and funding agencies.

Advice for Building New Programs

Maurice suggests:

1. Start small and sound and build gradually.
2. Lay a good groundwork with community and funding agencies.
3. Do not build a new building and a new program at the same time.

For further comments refer to his article "An Incomplete Guide to Establishing a Rehabilitation Engineering Program" in the Proceedings of the Fourth Annual Conference on Rehabilitation Engineering (available from RESNA).

Program H: Assistive Device Center (ADC)

Contact Person: Colette Coleman
Assistive Device Center
California State University - Sacramento
6000 J Street
Sacramento, California 95819
(916) 278-6422

The Assistive Device Center provides children and adults with education, training, information, clinical therapy, technical evaluation and fabrication services. Most services, 90% of which are provided in house, have involved augmentative communication and work and educational access. Most ADC clients have cerebral palsy, head injury, or neuromuscular disorders. The staff, consisting of two rehabilitation engineers, two speech therapists, one psychologist and one occupational therapist, work in a 1,650 -square-foot facility. Fee-for-service provides all of the programs $100,000 annual budget.

Program Origins

Al Cook, Professor of Biomedical Engineering at Sacramento State, developed the concept for the program because of community need. Al, along with Colette Coleman, Professor of Speech Pathology, and Lawrence Meyers, Professor of Psychology, did the three-month work of program planning and implementation. Opened in 1977, the program's direction was similar to what it is today.

Although there were no start-up funds, space and shared equipment were provided by the university's engineering department. Students and shared clerical staff assisted the three founders in initial service provision efforts. Key community contacts included the Easter Seal Society, local schools, California Children's Services, and the local Regional Center.

Evolution Years (1-3)

By 1980, the ADC was seeing 25 to 30 clients a year, with a total of 50 served. The program mission remained the same. Another engineer and a psychologist joined the staff. Fees-for-service provided 50% of the budget while grants and teaching activities made up the balance.

Problems Encountered

Colette rates the reason for beginning the program as successful. She feels that program planning should have considered funds and financial management, including investigating the costs of other programs and their funding. A more diversified staff including an OT/PT may have been better. Because the principal staff members were doing the program work in addition to other full-time commitments, developing community contacts was neglected, a "big mistake."

Advice for Building New Programs

Colette suggest three key factors for a new program:

1. Dedicated personnel,

2. Good management,
   and
3. Creativity in developing needed services and funding them.

In addition, she advises, "Stand back once in a while and look objectively at what you are doing. Take breaks or change emphasis for staff, or risk problems with job burn out."

Type 4: State Agency RET Programs

Program I: Pennsylvania Assistive Device Center

Contact Person: Mary Brady
Pennsylvania Assistive Device Center
Elizabethtown Hospital and Rehabilitation Center
Elizabethtown, Pennsylvania 17022
(717) 367-1161

The program provides communication and computer access technology to Pennsylvania special educators and students. Most students have cerebral palsy, are mentally retarded, or have various physically handicapping conditions. Services are provided off site and are primarily educational in nature.

The staff of seven includes an occupational therapist, speech therapist, rehabilitation engineer and educational technologist. The annual budget of $1.2 million, including $650,000 in equipment and $250,000 in salaries and benefits, is provided by state PL 94-142 funds.

Program Origins

Roland Hahn, Director of the Central PA Special Education Regional Resource Center, developed the concept for the program in response to a statewide need, and because of personal interest and opportunities and recent technical developments. Roland Hahn and Mary Brady, an educator with three years experience in rehabilitation technology hired as coordinator, did the four-month task of planning and implementing a program to provide high technology assistive devices to the special education population. The program, with start-up funds of $175,000, began in 1984 with $40,000 of equipment in three small offices. A rehabilitation engineer with five years experience and a full-time secretary completed the original staff.

Evolution Years (1-3)

Presently the PA-ADC is providing information to over 150 educators a year, and has helped a total of 500 with long term equipment loan at a cost of over $150,000, training of local specialists, technical support and educational services. Direct service efforts have been transferred to local "augmentative specialists" trained by the program. Facilities total 40,000 square feet with $100,000 of equipment. There is now $1.5 million-worth of equipment in the field.

Problems Encountered

Mary considers the key program areas very successful, including the mission statement, focused by a users' survey and support generated from the community. Things that might have worked better include involving myopic clinicians later in

the program planning process, having an equipment display area from the start, and planning more time to enable new staff to "get up to speed."

Advice for Building New Programs

Mary suggests:

1. Good planning - clear and specific goals.
2. Enough money, not nickel and diming it.
3. "Can do" people with the right skills and experience She also advises that the decision-making team should consist of more than two people who define program goals. Only then should staff input be sought. "Otherwise the whole program gets hopelessly mired in conflicting styles and ideas."

Program J: Rehabilitation Engineering Service,
Woodrow Wilson Rehabilitation Center

Contact Person: David Law, Jr.
Adaptive Equipment Specialist
Woodrow Wilson Rehabilitation Center
Fishersville, Virginia 22939
(703) 332-7073

This program provides specialized devices to a predominantly adult population. Ninety percent of the clients live in Virginia and have spinal cord or other traumatic injuries or congenital disorders. Although most design, fabrication, and consultation services are provided inhouse, a mobile workshop is used for off site provision. Clinical therapy services are a major component for the program with other activities including education and research and development.

The staff, two rehabilitation engineers and one fabrication/welder/machinist, have 2,100 square feet of work area, 1,600 square feet of which is shop space. Eighty-five percent of the $100,000 annual budget is provided by fees-for-service.

Program Origins

The director of the Woodrow Wilson Occupational Therapy Department established rehabilitation engineering services in order to provide specialized adaptation to meet personal goals of clients at the Woodrow Wilson Rehabilitation Center. After little or no planning, the program started in 1977 with funding from two federal grants, shared facilities, borrowed equipment, and one staff person, David Law, an adaptive equipment specialist and fabricator.

Evolution Years (1-3)

By 1980, the program was seeing 250 new clients a year and a total of 350 over the first three years. There was little change from the original program thrust. Resources by the end of the third year included the addition of a rehabilitation engineer to the staff, 500 square feet of work space and $20,000 of equipment. Ten percent of operating expenses were derived from fee-for-service with grants providing the balance of funding support.

Problems Encountered

The reason for beginning the program, initial program mission statement, working with key community people, and facilities were successful. The federal funding

base should have been used only for start-up capital because of excessive demands of accountability made by the granting agency, which did not understand service delivery. Facilities, equipment, and staff were somewhat limiting.

Advice for Building New Programs

Dave suggests three ways to start a successful program:

1. Hire pragmatists, not researchers or statisticians.
2. Start small, preferably as a part of a multidisciplinary team of professionals.
3. Keep good documentation records.
4. Lastly he cautions "don't get caught up in 'techno-lust'. . . keep it simple."

Type 5: Private Rehabilitation Engineering/Technology Firm

Program K: C. Gerald Warren and Associates

Contact Person: Gerald Warren
C. Gerald Warren and Associates
4825 Stanford Avenue, N.E.
Seattle, Washington 98105
(206) 525-3486

C. Gerald Warren and Associates is a small firm in Seattle providing off-site rehabilitation technology services to predominantly adult residents in Washington State. The three most common disabilities addressed are SCI, CP, and chronic pain. Half of the services provided are in the form of consultation, a quarter in technical evaluation and fabrication, with the balance in the form of education, clinical therapy services, and research and development. The staff consists of Gerald Warren as president and rehabilitation technologist, a part-time engineering intern, and 75% clerical/accounting staff person. There is 230 square feet of office space. The annual budget is $100,000.

Program Origins

In 1983 Gerald, an Associate Professor and Director of Rehabilitation Research and Engineering Applications Program at the University of Washington, began the company for a number of personal reasons and with an appreciation of community need. The company mission was to "apply technology to the needs of employable disabled persons." He worked alone in facilities that included an office, small shop, library, and a computer. He established relationships with the state vocational rehabilitation program and the Department of Labor and Industry (Worker's Compensation). Ten thousand dollars was available as start-up funds.

Evolution Years (1-3)

In the third year of operation he saw 75 clients, with a total number of 200 since the company began. Most services involved vocational rehabilitation and Worker's Compensation job site modifications, including computer implementation and injury prevention. Consultation on damages and liability in legal cases was added to the company's activities. Though facilities remained roughly the same, the total staff increased to 1.75. The company had accumulated $15,000 in equipment. All operating expenses were covered by fees-for-service.

Problems Encountered

Gerald considers the company successful in the areas of program concept, program planning, initial mission statement, and funds and financial management. He feels that more space, equipment, and staff were needed.

Advice for Building New Programs

He suggests the following key elements for a successful program.

1. Have a marketable service.
2. Maintain fee schedules and do not provide free services.
3. Ensure good financial planning, budgeting, and accounting.

In addition he advises: This type of practice (a private firm) generally requires a broad base of knowledge in comprehensive rehabilitation and depth in all aspects of rehabilitation engineering and technology. This is necessary because the referral patterns to private practice are extremely diffuse, and service requests arise from a wide spectrum of sources and disabilities. Being able to offer this type of service generally requires a good foundation in medical and vocational rehabilitation. In private practice one may not have the benefit of being an integral team member; however, to provide quality professional services it is absolutely necessary to understand and play that role and to establish a group of associates in the rehabilitation field. Most of the consulting work falls into two categories. The first is education/vocation employment related, i.e., return to school or work and its associated activities or injury prevention. The second category is litigation, which breaks down into the areas of liability, i.e., establishing the cause or blame for a loss or damages, or determining the role and cost of technology that may be used to compensate for functional losses. These activities may be performed for either defense or plaintiff.

The customers in the education/vocation area are state agencies such as the Division of Vocational Rehabilitation, Injured Workers/Labor and Industry, Developmental Disabilities, private insurance for medical and Worker's Compensation, and finally employers. Marketing to these customers is based on quality assurance, convincing them that the dollars spent will achieve the desired outcome. What they want is assured return to work or school in the shortest period of time with the lowest total dollar expenditure possible. Marketing is best accomplished by demonstrating examples of consistently successful interventions. The optimal method to do this is through inservices, training programs conducted by state or regional organizations. In the legal system there is little active marketing that is very effective because the network of referrals among attorneys is difficult to penetrate. There is no substitute for being identified as a good and credible witness. Consulting practices are built on referral, not advertising.

Operating in the private sector one must have some form of credential that identifies one as a qualified professional. It requires background and capability in small business administration. Knowledge of the business licensing, and registration for local, regional, state, and federal permits and taxes, as well as insurance for both professional and product liability are all required. The most important fundamental aspect in operating the business is an efficient and sound management and accounting system with a well-defined fee structure and billing system. Work for any customer should never be performed without written agreement to pay at established rates for consultation, evaluation, reporting, implementation, travel, and subcontracted services.

Program L: J.L. Mueller, Inc. (JLM)

Contact Person: Jim Mueller
2502 Taylor Avenue
Alexandria, Virginia 22302
(703) 549-8216

This one-man company in helps a predominantly East Coast adult population with back pain, spinal cord injury, and visual limitations function as independently as possible by providing services such as accessibility surveys and design, job analysis and accommodation, and fabrication of special hardware. Half of the services are in the form of consultations, 25% fabrication and the balance in training and clinical services. Eighty percent of the services are provided off site. Jim Mueller, a rehabilitation engineer/designer, works in a 750-square-foot facility. His annual budget is $50,000.

Program Origins

In 1981, Jim left his position as a research associate at the George Washington University Medical Center Job Development Laboratory to begin the company because he believed that rehabilitation engineering services were marketable in efforts to minimize the loss of disabled workers. With the focus of providing worksite, home, school, and environmental modifications for physically disabled people, he began with $25,000 in start-up funds, 500 square feet of office space, and a small fabrication shop augmented by identified community resources. He worked closely with businesses with disabled workers.

Evolution Years (1-3)

By 1984, he was seeing 10 new clients per year and served 25 in all. Most of the clients were of employable age and received worksite assistive equipment and accessibility modifications. The program's focus on job accommodation was expanded beyond hardware fabrication to include assisting employers with accommodation retraining, job restructuring, and reassignment. Facilities and staff remained unchanged. By the end of the third year, half of the operating expenses were covered by fees-for-service; half by disability management service fees and lecture fees.

Problems Encountered

"Early on it became obvious that rehabilitation engineering services alone cannot sustain a program. The most successful operation integrates rehabilitation engineering with other techniques for managing disability in the work force, such as job accommodation (hard and soft), liaison with medical professionals, personnel practices, etc." He also would have liked to have more working capital to pursue riskier and more aggressive marketing strategies. Working alone has been successful and, although more space would afford expanded capabilities, using community resources has had its advantages.

Advice for Building New Programs

Jim cites three key factors in creating a successful program:

1. Accurately target the market.
2. Develop a good marketing plan.
3. Secure adequate capital.

He adds, "Remember that the consumer is rarely as interested in technology as the service provider. The result is saved dollars, time, etc., in the product to be marketed and delivered. Therefore the rehabilitation engineering service provider must either be more than just a technologist or he/she should work as part of a larger agency, such as a vocational rehabilitation effort or an insurance carrier."

Program M: Rehabilitation Technology Services (RTS)

Contact Person: Jerry Weisman
University Orthopaedics
One South Prospect Street
Burlington, Vermont 05401
(802) 656-2953

Rehabilitation Technology Services, a small firm in Burlington, Vermont, provides residents of New England including northern New York State, with mobility, worksite modification, seating and positioning, communication, aids for daily living, school room modifications, and architectural accessibility services. Most clients served are adults and the most common disabilities addressed are low back pain, CP and SCI. Company activities include an equal proportion of consultation, research and development, and technical evaluation and fabrication . Some time is spent on educational activities.

The staff, consisting of a rehabilitation engineer, three part time technicians, and a secretary, share a 1650-square-foot facility. Seventy percent of the programs $75,000 annual budget is derived from fees-for-service and 30% from grants.

Program Origins

Jerry Weisman, M.S., M.E., worked for nine years as a bioengineer and director of rehabilitation engineering at Crotched Mountain Rehabilitation Center before beginning RTS in 1983. He left his position because he felt a lack of administrative commitment to rehabilitation engineering, and he desired a more flexible work environment. Duplicating services provided at Crotched Mountain, he and his two partners began working with "almost anyone on anything." Early key community contacts included state vocational rehabilitation agencies, the Vermont Rehabilitation Engineering Center, and a local acute rehabilitation unit with which a contract for services was negotiated. Resources consisted of a partner's shop and an office in Jerry's home. Soon, $10,000 was borrowed to equip the shop.

Evolution Years (1-3)

In 1986, RTS saw 100 clients. During three years, 250 were served. There has been no change in the original broad scope of services and populations. Jerry now consults with Vermont Rehabilitation Center and shares its facilities. His partners are no longer with the company.

Problems Encountered

Jerry considers his reason for beginning the program and work with key community people very successful. Lack of program planning continues to be a problem. He hesitated taking time from the hectic pace of day-to-day service provision. The additional help of a rehabilitation engineer, technician, and secretary, a "critical mass" for a successful program, would allow more time for planning. Because of low

population density in the area served his thrust of a broad scope of services has worked well and he feels it would be counterproductive to limit it.

Advice for Building New Programs

Jerry suggests three key factors for new programs.

1. A person willing to "carry the ball" and see the program through.
2. Ability to provide services responsive to community need.
3. A positive cash flow; a well-capitalized program.

He also suggests, "seek support from as many people as possible, both moral and financial. This includes approaching funding agencies to write contracts instead of just providing services on a fee-for-service basis. Contracts secure cash flow. Get as many people on your side who can ultimately provide help to you in the way of funding, referrals, equipment, etc."

Type 6: National Nonprofit Disability Organizations

Program N: The Cerebral Palsy Research Foundation of Kansas

Contact Person: John H. Leslie, Jr., Ph.D.
Executive Vice President
Cerebral Palsy Research Foundation of Kansas, Inc.
P.O. Box 8217
2021 North Old Manor
Wichita, Kansas 67208
(316) 688-1888

This is a unique organization established to provide integrated services to people with severe physical disabilities to allow them to achieve an independent lifestyle consistent with their personal aspirations. Most clients are adults and live in Kansas (2 million population) or in the Midwest (7+ million population). Most clients have cerebral palsy, although those with brain injuries, spinal cord injuries, spina bifida, MD, MS, and other conditions have also been served. Services, 75% provided in house, include employment, residential services, rehabilitation technology, and education. Physical therapy, speech and communication, work evaluation, and job placement services are also offered. The center's service activities of education, technical evaluation, and fabrication benefit from rotated efforts in research and development.

The staff of 52 includes 7 rehabilitation engineers, 2.5 physical therapists, 2 speech/audiologists, 4 case managers, 2 accountants, and 20 aides and attendants for the residential program. CPR has 10,300 square fee of space, 2950 of which is shared. The annual budget of $3 million is made up of 35% Medicare funds, 35% NIDRR REC funds, 15% State block grant funds, 10% county mill levy funds and 5% fees-for-service.

Program Origins

John Jonas, Executive Director UCP of Kansas, envisioned the program as a response to the need to develop meaningful job opportunities for people with severe disabilities. John Jonas, trained in speech therapy and audiology, and John Leslie, trained in industrial and mechanical engineering, began the six-month work of program planning and implementation in 1972, with the focus of providing employment opportunities to people with severe disabilities, especially those with cerebral palsy.

Contacts were established with state and federal legislators, community leaders, bankers, C.P.A.'s, and private business people.

Resources included a staff of two part-time faculty from Wichita State University, and six full-time professional rehabilitation staff. An existing summer camp served as the residential facilities, and engineering laboratories at the University served as work areas. Fifty thousand dollars was available as start-up funds.

Evolution Years (1-3)

By 1975, the program was seeing 200 new clients a year, having served a total of 550, most of whom, primarily cerebral palsied adults, received housing, attendant care, and vocational evaluation and placement.

Resources included a staff of 25, and a 10,000-square-foot facility with $25,000 of equipment. Of the organization's third-year budget of $200,000, 15% was derived from fees-for-service with the balance supplied by federal and state grants (80%) and State Title XX Funds (20%). Because many severely disabled people were not being placed in mainstream employment even though engineering data indicated it was feasible, Center Industries was developed. Center Industries is an innovative manufacturing company utilizing both disabled and able bodied workers.

Problems Encountered

Reasons for starting the program and working with key community people were successful. Program planning was inadequate because it did not anticipate the need in the community and the inadequate and unrealistic funding sources for community-based programs. The mission statement was too broadly defined resulting in the program trying to be "all things to all people." Admission criteria into various programs was vague, resulting in inadequate services. Fee-for-service structures did not exist or were not viable. Operating on a "hand shake" fiscal policy grossly underestimated the need for strict accounting and auditing control procedures. The initial residential facilities were not suitable, replaced later by the HUD Timbers program. Shop facilities were scattered and uncoordinated. Client transportation has always been a problem. It was hard to find engineering staff with a design, problem-solving orientation. Self-motivated staff requiring a minimum of motivation were also hard to find.

Advice for Building New Programs

John Leslie, the program cofounder and director, suggests the following key factors essential in creating a new service program.

1. Rigorously investigate sources of funding which are reliable and longitudinal, be wary of grants for long-term support.
2. Define the mission statement within a narrow context so you will not spread your staff and fiscal resources too thin; resist the ideal of being "all things to all people."
3. Establish rigid accounting control procedures to avoid audit exceptions.
4. Determine the need and extent of the market for your services.

In conclusion, he advises "Run the program as a business, seek to obtain community professional leadership on your board of directors, avoid the 'bleeding heart' approach – the moral value of rehabilitation is a 'given,' the business success of rehabilitation ventures is NOT a 'given.'"

Type 7: Volunteer Organizations

Program O: Physically Impaired Association of Michigan:
PAM Assistance Center/Living and Learning Resource Center

Contact Person: Arselia Ensign, Director
PAM Assistance Center
601 West Maple Street
Lansing, Michigan 48906
(517) 371-5897

The PAM Center provides disabled individuals of all ages with information, demonstrations and consultations regarding assistive devices. In addition to inhouse service provision, the staff also conducts inservice training and awareness programs. PAM's 8.5-person staff includes a director, two occupational therapists, a technology and vision specialist, a technician and an ABLEDATA broker. The center is located in two facilities with a total of 2,100 square feet. Last year PAM served approximately 2,500 clients who live in Lansing (population 133,000) and elsewhere in Michigan (population 9,144,600). Its budget is approximately $230,000. State project funds provide the majority of the operating budget.

Program Origins

Ms. Ensign, program director, began the program in 1979 because she wanted to help bridge the information gap between suppliers and consumers of assistive devices. After seven months of planning and preliminary service provision the program officially opened in a first-floor apartment rented for $10 a month from a supportive local medical equipment dealer. A ramp and furnishings were donated by local merchants and volunteers. Initially the only funding available was in the form of modest donations. The staff consisted of Ms. Ensign, who had experience in special education, a Ph.D. in Education Administration, and who had consulted for the Michigan Department of Education for 11 years. She also held a position in the State Department in Washington, DC. An experienced rehabilitation nurse was hired. By 1980, a full-time secretary and volunteer occupational therapist joined the staff. Key contacts during the program start up included special educators, community service providers, and local merchants.

Evolution Years (1-3)

By 1983, PAM was serving 558 new clients per year with a total of 1100 over the first three years. Eighty percent of the clients were parents and caregivers of physically handicapped. The program's focus had not fundamentally changed. By the end of the third year, more emphasis was given the individual client over visitors, and publications were used to help distant potential clients. Eighty percent of program funding was awarded by the state department of education PL94-142 project, with donations and memberships making up the remaining 20%. Other resources included a staff of 4.5, a 1,500-square-foot facility and primarily loaned or borrowed equipment.

Problems Encountered

The reason for beginning the program, program planning, the initial mission statement, and working with key community people have been successful. Lack of funds limits badly needed additional staff time to keep up with increasing demands.

Advice for Building New Programs

Ms. Ensign cites three key factors essential to building a new service program:

1. Motivation and persistence.
2. Belief in the documented need and value of proposed services.
3. Ability to attract many people, both to support the program and to use its services.

In addition, she recommends, "Involve from the beginning those persons whom you propose to se- 'e. (Listen to them, be humble and friendly.) Don't erect a paper castle which cou go down with one strong, unfriendly wind. Visualize what you wish to achieve a. assume the happening. Dedicate yourself to success."

CHAPTER FOUR:
BUSINESS PRACTICES – THEIR APPLICATION TO REHABILITATION TECHNOLOGY SERVICES

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CHAPTER FOUR:
BUSINESS PRACTICES – THEIR APPLICATION TO REHABILITATION TECHNOLOGY SERVICES

John H. Leslie

It should be stated at the outset that good, fundamental business practices are applicable to any organization, whether it be a major corporation, a small "mom and pop" business, or a rehabilitation technology service organization. Therefore, readers should further educate themselves by either reading introductory textbooks on the subjects of accounting, administration, personnel management, and marketing, or by attending formal classroom programs devoted to these subjects. The University of San Francisco, Southern Illinois University, and Drake University, among others, offer excellent graduate programs in rehabilitation administration. The reader should consider these programs if he/she has the opportunity to do so. Additionally, short courses, with or without college credit, are offered by numerous rehabilitation agencies to acquaint their membership with sound business principles. Chapter Seven of this book includes several excellent reference sources which can be utilized for further information on this subject.

This chapter is devoted to "tricks of the trade" relative to the business of providing rehabilitation technology services. These "gems of wisdom" will not be found in formal textbooks on management, accounting, or marketing but are peculiar to the field of rehabilitation and should be accepted as such. They examine the administrative nuances that can spell the difference between success and failure of a rehabilitation technology service delivery venture. They should be used to supplement good reference material fundamental to the subject.

General Organizational Issues

Many of the principal management/administration practices related to the development and/or operation of a financially and operationally sound rehabilitation technology service delivery program are the same as for any other business, but have different application. For example, many rehabilitation agencies are structured as not-for-profit organizations under IRS designation 501(c)3. If an organization wants to actively pursue both federal and state grant sources, a nonprofit organization may be its only alternative. Organizations existing within a foundation and/or medical structure may also be restricted to nonprofit status. However, many rehabilitation programs are now examining for-profit entities as an adjunct to their existing businesses. The development of unencumbered funds, to be utilized to subsidize underfunded programs or develop venture capital for pursuing new endeavors, are for-profit characteristics that have a great deal of merit. Each structure has its own set of advantages and disadvantages, and the author encourages the reader to weigh them carefully.

A fundamental question which should be asked early in the development of any management system is whether it is to be centralized or decentralized. Since most rehabilitation technology service delivery programs require an interdisciplinary, team approach, it is imperative that one individual be assigned primary responsibility for ultimate client/patient outcomes. In a medical environment, this person is usually the primary care physician, while in an applied engineering context it may be

the chief or project engineer. It should be noted that specific management plans with written, identified superior-subordinate relationships are absolutely necessary. Decentralized management requires a significant communication and feedback network in order that the persons doing the job can communicate results to top management of the organization. A highly structured, centralized management system, while minimizing communication and feedback systems, in many cases spoils the comraderie of the interdisciplinary team approach utilized in a decentralized organization. As before, there are pros and cons to consider. The "bottom line," however, is to choose the system that best serves the needs of the client/patient.

Personnel Practices

Closely associated with the statements outlined above are the elements of staff allocation and training. Since the team approach is usually utilized, professional people are given multiple task assignments. It is absolutely essential that staff time be allocated in order not to budget them for more than 100% of their time. Third party payers and grant funding agencies will not tolerate allocating individuals more than 100%. Additionally, it is not a prudent personnel management practice to assign staff tasks that require more time than they have available. Rehabilitation technology is a highly dynamic field. Therefore, it is imperative that training programs be conducted on an ongoing formal basis for all staff associated with a service delivery effort. This training can be inhouse, provided during normal working hours by recognized experts on staff, or through college-level training, either credit or noncredit, conducted by faculty competent in the field. The important thing to remember is that staff development and continuing education programs are absolutely mandatory. It is an activity that should not take a "back seat" to other more pressing business issues. The life blood of any effective rehabilitation organization depends on keeping its staff sharp and up to date.

Marketing – A Necessary Evil

In order to develop effective marketing programs for fee-for-service rehabilitation organizations, it is necessary to define the fundamental goals and mission of the organization. A mission statement outlining the role of the organization relative to the type of service it intends to provide, population to be served, funding resources utilized, etc., serves as the basis for the development of a fundamental marketing plan. Marketing is a necessary organizational process that requires considerable professional expertise. Most agencies have opted to hire consultants to develop marketing plans consistent with their predefined goals and objectives. If an organization is determined to do marketing inhouse, it is highly encouraged to develop a dedicated marketing department, staffed by trained people with experience and background in marketing systems. This is one administrative function that cannot be run "out of the hip pocket." The determination of the potential population for the services, the development of advertising programs, and promotional campaigns are best left to the experts. However, many agencies have developed excellent marketing programs, but they have, in most cases, committed significant resources both from the standpoint of finances and personnel.

Fiscal Management and Control

The fiscal elements of running an organization providing rehabilitation technology services are not that different from the accounting procedures utilized for for-profit businesses. However, some procedures are significantly different and vitally

important to the fiscal viability of any service delivery organization. One of the first questions which must be asked, particularly in the development of a new service delivery organization, is "Where are the sources of venture capital?" Many organization utilize federal and/or state grants to obtain the resources to establish a service delivery business. Grants are a two-edged sword. Even though cash may flow on a fairly routine basis, grants are usually time limited, i.e., two to five years. They are finite! Additionally, funding agencies, especially at the federal level, require a negotiated indirect cost (overhead) rate. This rate (based on either their or your accounting procedures) may not include appropriate costs, since many are deemed "unallowable." Once negotiated, a stipulated rate has to be charged over the life of the grant. This procedure has a mix of benefits and burdens which should be thoroughly investigated. Beware of grants' siren song. Any organization should prepare to be fiscally solvent and in the black after the termination of start-up grants. The day the grant is received, the organization should start the development of a fee-for-service structure in order to be financially viable on expiration of grant revenue.

Currently, local venture capital organizations are making monies available to organizations initiating a business. The reader should be aware, however, that as a rule the cost of such capital is extremely high. In some cases, investors expect a return as high as 50%. Local bankers will loan money based on sound business planning. Revenue bonds, county mill levies, etc., may be utilized as venture capital in certain geographic areas of the country. Each state is different, however, so it is "buyer beware." Always remember, loans have to be repaid and debt service has to be included in fees-for-service.

Sound accounting principles should be the rule rather than the exception for a fee-for-service rehabilitation organization. Each department/ operating entity should prepare a budget to be utilized for a predetermined fiscal year. Effective cost accounting procedures should be developed to ensure the timely collection of fee-for-service revenues, the write-off of bad debts, the development of cost centers, etc. Each program manager should be held accountable for his/her budget, and deviations from budgets should be rigidly justified. One should realize that, in this profession, it is very difficult to generate unencumbered fund accounts. Therefore, effective budgeting is a highly significant business activity. Organizations utilizing grant funding should be aware that if a grant is under-expended the money has to be given back and if the grant is over-expended the organization is "stuck" for repayment.

In order to run an effective service delivery organization, the reader will discover that it is necessary to combine a multitude of funding sources: public, private, those involving third-party payers, and others exclusively related to grant revenues. The result of all of this is "wall to wall" auditing. Many funding organizations have highly restrictive procedures for the utilization of their money. In some cases, funding agencies have conflicting auditing requirements, meaning that "you are damned if you do and damned if you don't." Extreme care should be exercised in fiscal management to ensure that audit exceptions are kept to an absolute minimum. Many grants require in-kind match, either from a direct fiscal standpoint or from a personnel service perspective. Extreme care should be exercised to document in-kind matching, or audit exceptions will be the ultimate result and funding will be jeopardized.

Qualified accounting personnel can explain the fundamental differences in auditing procedures for profit versus nonprofit organizations. However, the primary difference is that a nonprofit organization is responsible for all of the money that it receives no matter where it comes from, whereas the for-profit organization generates unencumbered revenue that it can use at will. To satisfy audit requirements, the organization should develop performance indices vital to the economic and pro-

grammatic vitality of the organization. These indices can take the form of cost:benefit ratios, service delivery statistics, unit cost data, etc. For example, bad-debt write-off divided by the number of clients served can provide extremely significant information relative to debt write-off per client. The ratio of staff time spent on efforts generating revenue versus time spent on services that are provided free of charge can be a valuable indication of the effective utilization of staff time. The organization is encouraged to develop its own "home grown" indices to measure the economic health of the organization.

The above statements are rather specific since they present the "do's and don'ts" relative to effective fiscal management of a service delivery organization. The reader is encouraged to consult Chapter Seven for resource information on fundamental business principles that apply to all organizations. This information should be considered as only a primer; experience will reinforce many of the concepts contained in reference texts.

Models of Service Delivery

Previous as well as subsequent chapters will provide details on specific organizational models of rehabilitation technology service delivery such as the following:

Model 1: Durable Medical Equipment (DME) Supplier
Model 2: Department within a Comprehensive Rehabilitation Program
Model 3: Technology Service Delivery Center in a University
Model 4: State Agency-Based Program
Model 5: Private Rehabilitation Engineering/Technology Firm
Model 6: National Nonprofit Disability Organization
Model 7: Miscellaneous Types of Programs, Including Volunteer Agencies

The concept is mentioned here only to outline the types of organizational entities found in the profession. Nonprofit organizations and/or foundations constitute the first general model. They are typically funded by grant revenue and public funding sources. Many of them were established as research enterprises with a subsequent organizational spin-off into the field of service delivery. They may receive public monies through state block grants, Title XIX (Medicare), Medicaid, county mill levy monies (traditionally allocated by County Boards of Mental Retardation/Developmental Disabilities Agencies on a percentage of county tax revenues), etc. Research activities are funded through grant processes, whereas service delivery programs are usually supported by public social service funding sources. Fees-for-service are received from third-party payers, and disability advocacy associations (MDA, UCPA, MS, etc.) A paramount issue confronting many service organizations is the fact that their operating costs are not completely sustained by their funding sources. They must be subsidized by other revenue streams.

The second model involves hospital-affiliated service delivery programs. These organizations may either be nonprofit existing in traditional hospital/medical systems or private for-profit organizations that have an internal rehabilitation entity recognized by the parent corporation. In virtually all cases, rehabilitation technology services are prescribed by a physician. It is relatively easy to obtain reimbursement for them because they are provided within the context of an institution-based medical model. Community based nonprofit programs, such as those outlined above, may be marginally funded at best.

The third entity is a hospital/university-based outpatient program. In this case, rehabilitation technology services are provided on an outpatient basis to individuals

after they leave the primary care, post-trauma hospital. If funding is integrated into the overall medical benefit system associated with the patient, then cash flow is relatively constant and covers actual costs. If revenue is dependent on community-based programming, however, funds may not flow readily (if at all) and bad debts may need to be written off.

The next two models are integrated into one since their primary role is to secure a profit. The private entrepreneur who "hangs out his/her shingle" as a rehabilitation technology professional basically charges fees-for-service. Their funding sources may consist of third-party payers, organizations representing specific disabilities, public agencies, i.e., Vocational Rehabilitation, private foundations, and individual payers. Even though the small entrepreneur may be organizationally structured to make a profit, he/she will probably operate on a break-even margin. The rehabilitation finance system in this country and, to a certain extent, Canada is simply not cognizant of the need to pay the costs associated with rehabilitation services and thus provide the entrepreneur a reasonable profit. Any person getting into this field should realize this fact and be prepared for some "lean years."

The more prominent DME organizations, however, are broadly based, adequately funded, and have a successful history in the field, particularly working in the medical model. However, DME suppliers, structured for profit, typically do write off a small portion of bad debt. This is built into their pricing formulas for the monies that they do collect. For-profit DME organizations are typically efficiently run, tightly managed, and do well financially. This is the organizational model that all businesses should examine in detail if they are considering a for-profit business.

No matter what the model, any organization providing fees-for-service in a rehabilitation technology context should adopt fundamental accounting procedures relative to what is charged and not charged for their services. There will be temptation to offer services for free since, in many cases, persons with disabilities simply cannot afford the cost of the technology that they need. It is mandatory that no "freebies" be provided except through a formal, documented accounting write-off procedure. The consistent provision of free services, no matter how valid the motive, will ensure the financial demise of any organization.

The Concept of Price and Collection

In order to keep the services as cost effective as possible, the organization should realize that custom, one of a kind solutions should be kept to a minimum. "Off-the-shelf" hardware, modified appropriately to suit the needs of the client, is generally the most cost-effective solution. Also, appropriate cost data relative to hardware, personnel time, clerical expense, indirect cost, etc., should be maintained in order to establish an accurate data base to document what it is costing to provide the service. As stated above, write-offs should be integrated into a bottom line budget to ensure a minimum of "red ink."

In many if not most instances, service payers require prior authorization in writing in order to validate that they only pay pre-authorized costs for services. In no case should a service be provided for clients of these agencies without prior authorization. If it is done, the organization might find that it either collects no revenue or only part of the cost of the service provided.

As a reinforcement of the concept stated above, it is mandatory that all services should be charged on the basis of market value predicated on accurate cost accounting data. Even though there may be much "heart string tugging," particularly in those situations involving persons who simply cannot pay for the services, the total cost of the device/service should be billed and partial write-offs considered if the

client cannot pay. This information should be placed on standard, authorized billing forms to ensure that there are no misunderstandings as to who pays, what they pay, and what will have to be written off. Standard forms ensure standard operating procedures resulting in consistent, fair treatment of clients. No cries of partiality and/or arbitrary treatment can be forthcoming if all persons are treated the same.

In order to ensure adequate cash flow and no misunderstanding relative to prior authorization, it is simply a good business practice to cultivate personal and professional contacts with management personnel in positions of authority at the major funding agencies. This issue will be covered in more detail in Chapter Five. In many cases, a simple telephone call will result in a quick solution to a very troublesome problem if adequate contacts have been made in advance with persons in authority. The development of creditability, strict honesty, and an understanding of the rules under which major funding organizations have to operate are an absolute must to develop fruitful associations of mutual trust.

Client Scheduling Practices

Written policies and procedures should be developed to ensure the delivery of quality services consistent with effective case management. Multidisciplinary rehabilitation teams should be organized with specific responsibility assigned to team members consistent with their professional expertise. Written scheduling systems should be developed and rigorously enforced to expedite the utilization of manpower and to ensure effective staff resource management. "No-shows" should be minimized through concerted appointment systems utilizing follow-up calls and formal notification of appointments to appear before the interdisciplinary team. Clients/patients who arrive late should be rescheduled. They should not be accommodated because lateness will become the rule rather than the exception. Clients who arrive late should only be served in cases of obvious dire hardship.

Quality Assurance: A Paramount Objective

As previously stated, the competence of the team should be enforced through a written program of quality control in which effective indices of performance have been mutually agreed on. Formal and informal continuing education programs should be maintained to ensure that the staff stays on the "cutting edge" of the profession.

As a complementary function, comprehensive intake programs should be created which collect key client/patient data pertaining to personal and medical conditions as well as specific identification of the referral/payment agency. All information should be documented in written form. No verbal or hearsay information should be utilized. It will not stand up in a court of law nor will it stand up under close auditing scrutiny. Funding information relative to what is paid for, how much is paid, and payment schedules should be included in this document along with a signed prior-authorization-for-service form. All patient/client services should be documented through a narrative description of the service as well as the staff time involved. Patient/client files should include a scheduled follow-up regimen consistent with the demands of the funding/referral sources. Training, refitting, and maintenance of the device should be included in a formal contractual arrangement in order to ensure no misunderstandings.

Client files should be kept in a confidential, locked environment consistent with requirements of the funding/referral agency and appropriate accreditation organizations. Legal counsel should be consulted to determine what records are necessary to comply with local, state, and federal regulations. Client record retention policies

should be developed in order to determine how long data should be held in order to comply with regulatory and accreditation requirements. Information subject to audit should be maintained accordingly. Client folders should contain original copies of all appropriate signed documents relative to photo releases, releases of information, prescriptions, treatment plans, and reports from consultants such as psychologists, physical therapists, occupational therapists, and/or vocational rehabilitation agencies. Client files should include copies of all invoices, purchase orders, and job tickets in order to completely document the billing of services.

As stated above, programs should be organized to ensure that the ultimate consumer of rehabilitation technology services will benefit. Follow-up visits should be scheduled on a routine basis, in writing. In order to guarantee that the client gets the optimum use from his device and/or service, the organization should conduct continual evaluation, adjustment, and training programs to allow the client to get the most "bang" for his/her bucks. Postservice fee schedules should be determined and billed after an initial, free follow-up period. If devices are covered be either expressed or implied warranties, legal counsel should be consulted in order that warranty services can be provided consistent with what is mandated by law and/or funding/certification agencies. It is absolutely mandatory that an agency always provides services and/or devices on a formal, referral contractual basis. The "handshake" agreement is simply not a way to run an effective business.

Sources of Information

It has been emphasized throughout that any organization providing rehabilitation technology services/devices has to stay on the cutting edge of technology in order that persons with disabilities can truly benefit from the profession. Therefore, a business desiring to remain fiscally viable in this field for any length of time must utilize existing information optimally to ensure the cost-effective delivery of devices/services.

The service organization is encouraged to maintain files of custom devices which can be utilized for similar projects in the future. A valid criticism leveled at the profession is that it tends to "reinvent the wheel" over and over. Services provided should be adequately documented and referred to in the future if similar needs are identified. It is a matter of good practice to take photographs of the client/patient for before-and-after comparison of the application of the service/device. This practice results in good public relations and can be effectively utilized to justify rehabilitation engineering/technology on a cost-effective basis.

The federal RECs are extremely valuable sources of state-of-the-art knowledge relative to devices and/or rehabilitation methodology. They receive literally millions of dollars of funding by NIDRR to research solutions to specific problems confronting persons with disabilities in a host of environments. Their annual reports are generally free of charge. Therefore, it is wise to get on their mailing lists for their publications, both written and multimedia. Research that is unique and has resulted in cost-effective application is mandated by NIDRR to be documented in written and graphic media to be replicated by rehabilitation professionals.

The RESNA annual conference is an excellent vehicle for the dissemination of research data. There will be a great impetus in the future for researchers to standardize their reporting procedures so that results can be shared throughout the North American continent. Organizations such as NIDRR and RESNA will undertake a leadership role in the future to develop automated reporting systems in order that technical information can be effectively shared and thus client/patient services can be optimized.

Who Sues and Who Pays

A nagging issue that will confront rehabilitation technology clinicians, if not now, in the immediate future, relates to product liability/malpractice. The progressive organization should realize this is a professional fact of life and integrate risk management into its basic policies and procedures. Those organizations with an affiliation with a state and/or medical facility may have limited, blanket liability coverage under the aegis of this affiliation. The prudent business must seek legal counsel to verify the limits of coverage. If liability coverage is not available under affiliation agreements, the organization should be cognizant that private insurance carriers, almost without exception, insist on a maximum ceiling level at a significant cost. It pays to shop to discover the best insurance value for the dollar. Many times, the issue of malpractice/liability is only considered relative to professional staff actually providing direct service. It should be realized that boards of directors and agency executives are also liable. They should be provided with as broad a liability coverage as can be afforded. It should be remembered that any enterprise can be and will be sued. There is no place to hide. Prominent board members with significant wealth are vulnerable targets for unscrupulous lawyers seeking a fast buck. Additionally, as a matter of good business practice, all employees directly and indirectly involved in the provision of services should be provided bonding by the appropriate agency.

The Ups and Downs of the Professions

Every organization providing technology services with any track record at all has stories relating to the tremendous personal success achieved by a person with a severe disability. These are stories which "warm hearts" and encourage staff to remain in the profession and resist the lure of high salaries somewhere else. Concurrently with the success stories, however, are those stories of absolute horror in which a device failed miserably. It was prohibitively expensive, it could not be maintained, etc. Case studies can be cited to present success stories to stimulate the reader and horror stories to caution ones with expectations of utopia. Included in this document are actual case studies presented by organizations having significant experience in the field. They can happen to any organization and should not be considered exceptions. They are a result of the "school of hard knocks" and should be taken at face value. These case studies were presented in Chapter Three.

Chapter Seven includes resource information on management and accounting principles. A listing of assistive agencies, both public and private, that can benefit organizations seeking to enter the field is also outlined. Finally, the chapter contains a comprehensive source of automated data bases. The reader is encouraged to utilize the information in Chapter Seven as supplementary knowledge for the tenets presented above.

The Future

The concept of rehabilitation technology is an idea whose time has come. The next several years will be exciting times, full of reward and frustration as agencies emerge to fulfill the rehabilitation technology mandates specified by the Rehabilitation Act Amendments of 1986. The information contained in this document should not be considered as an end in itself. It is a means to an end. That end is assisting persons with disabilities to lead fruitful and productive lives. If this goal is not the ultimate human result, then this document is only meaningless words.

CHAPTER FIVE:
FUNDING SOURCES AND STRATEGIES

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CHAPTER FIVE:
FUNDING SOURCES AND STRATEGIES

Samuel McFarland
Kenneth G. Reeb, Jr.

"Rehabilitation is no longer a religion; it is now a business." (Kerstatter, 1985)

Overview

Rehabilitation engineering services, as presently practiced by the contributors to this book, are not high-profit business ventures, but, with diligence, are operated as self-supporting enterprises with highly satisfying personal and secondary benefits for the operators. Certain single-service enterprises, such as prosthetic shops and custom-seating fabricators, have been developed into very lucrative businesses. In general, however, rehabilitation engineering services are very labor intensive operations trying to survive in a product-oriented payment system. One cannot expect simply to send a bill for services and receive prompt payment in return. Instead, the payment must be pursued. Experience has shown that the minimum staff for a business would consist of two people; one to provide the specialty services and another to pursue the payments. Reimbursement is an elusive target in this business. The title of this chapter was carefully written to emphasize the attention that must be given to pursuing payment for the services rendered.

Money is an inextricable part of starting and running a rehabilitation engineering business. As emphasized in Chapter Four, it is fundamental that one must use sound fiscal management, just to stay in business. But the money must first be acquired before it can be managed, and the nature of the business environment for this specialty is different enough from the norm that unique techniques and strategies must be employed to ensure its acquisition. This chapter attempts to characterize the unique service capabilities that can be offered and the demand that exists for such businesses while relating them to more conventional product-oriented consumer or institutional services. In the pages that follow, the reader will find reflections of the experiences of those who have been successful in putting together financially viable businesses in the rehabilitation product field. Certain general principles have been refined from the collection of varied experiences, but we have also chosen to present vignettes of selected individual efforts, so that the reader can draw independent conclusions.

Each chapter has pointed to the central importance of acquisition and management of money while building and sustaining a rehabilitation engineering service. This chapter attempts to capture and unite those references into a cohesive discussion. It deals with three central issues; the funds to start a business, the capabilities that will earn money, and the needs for which payers will spend their funds. The order of importance will vary, but the issues remain central.

Program Start-Up Requirements

Chapter Three emphasized the reality that any new rehabilitation engineering program undoubtedly will undergo a start-up period during which there will be rapid growth of internal capabilities and the development of a payment base. It is vital

that program planners recognize this start-up reality and plan accordingly. The program's non-reimbursable financial needs, in particular, must be estimated carefully for that period. Once they are identified, a concerted effort to raise the funds to meet those needs follows as a critical responsibility. If start-up financial needs are estimated realistically and if fund-raising efforts based on those estimates are successful, it is much more likely that the program will survive its initial phase of development and eventually attain a more stable level of fiscal performance through fee revenues.

Estimating Financial Needs

When estimating start-up financial requirements, consider these questions regarding the expected time frame for program start-up.

- How long a period of ground work is required before the first services are provided?
- Assuming an effective marketing effort, how rapidly can client referrals increase thereafter?
- How much delay can be expected, on average, in payment for services rendered?
- At what point can the program be expected to reach a service delivery plateau, where organizational resources (personnel, equipment, etc.) are being used efficiently and a profit is being realized?

Experiences of existing programs may provide insights when considering these questions for your program. Some valuable program experiences have been recorded in Chapter Three. Table 3-3, for example, indicates a wide range of start-up investments ($0 to $800,000), as well as the number of clients served per year (35 to 2,500). There seems to be less variance, however, in the number of staff full-time equivalents (FTEs) employed during start-up. The table provides additional information of value to program planners, such as space requirements, etc. Programs studied in Chapter Three suggest that a start-up period of three years is common. The reader is strongly encouraged to explore the tables and case studies of Chapter Three in detail, particularly those that more closely resemble one's anticipated program model, so as to gain insights into start-up resource needs and associated financial needs.

Answering the above questions and investigating the data in Chapter Three should help planners explicitly formulate some critical assumptions about their programs. It will define the expected time period for a new program to become fully operational, which will serve as a framework for estimating program costs during that period, and as a goal for transition to a self-sustaining program. With that framework established, a process of estimating start-up costs can be pursued. It is highly recommended that estimates be derived for each year of the start-up period. If, for example, you estimate a three-year time frame, you are advised to generate three pro forma budgets. There will tend to be changes in budgetary needs within the start-up period. Costs associated with those changes are best reflected in a series of budget statements, rather than in one budget that forecasts activity for the entire period.

Budgeting is basically an assumption-making process. Program planners must make some fundamental assumptions about their program's environment, its internal activities, and the costs of performing those activities. The process is no different for a rehabilitation engineering service than for any other enterprise. The interested

reader is encouraged to seek additional detail on budgeting from the business-oriented literature. Perhaps a starting point is Selected Aspects of Financial Management in Rehabilitation Facilities: A Resource Manual (Lorenz et. al., 1981). Additional references are suggested in Chapter Seven.

Of course, the assumptions that are made will depend on the program being developed and may vary from case to case and among service delivery models, as evidenced in Table 3-3. It is impossible, therefore, to describe the ideal budget here. Instead, the "ideal" budget remains the responsibility of program planners, with guidance from the experiential data tabulated in Chapter Three.

It is recommended that when developing assumptions and financial estimates for program start-up, the financial forms of potential funding sources be used. Different funding sources may require different financial forms. Some may require projected income and cash flow statements. Others may expect less detailed budget work ups. Of course, they will all tend to expect planners to demonstrate that they have given serious thought to start-up resource requirements, including personnel and fringe benefits, equipment, materials and inventory, insurance and legal fees, facilities and overhead, etc. It is recommended that program planners obtain financial forms from candidate funding sources, up-front, and use those to guide forecasting of start-up financial requirements.

With realistic pro forma financial statements developed, program planners can pursue start-up fund raising to meet initial financial needs, at least until the program can begin generating sufficient revenue from operations to become a more solvent enterprise. Later, when program expansion and business growth changes are indicated, a similar process may need to be invoked.

Finding Start-Up Funding Sources

There are three basic sources of money that can be used to start a business in rehabilitation engineering services: investors, lenders, and donations or grants. Investors may be single or multiple, a sole proprietor or a parent company. Parties who might be interested in investing include people with disabilities, their relatives or employers, referral sources such as doctors, hospitals or insurers, businesses with related products or services, and the individuals who plan to operate the business. Because of the small profit returns that have characterized these kinds of businesses in the past, venture capitalists, common sources of start-up funding, have tended to shy away from these types of businesses, but increasing visibility of the field may change that posture. The most committed, but often most limited, source of start up funds are the persons who are going to perform the service around which the business is being formed.

Commercial lenders, such as banks, can be approached for loans to start a business. The process is relatively simple, but the amount of paperwork and direct negotiating is significant, requiring considerable time and energy. Loans for a start-up operation are granted on the basis of an assessment of the ability to pay back the loan, plus interest, over time. Most commonly, the lending agency will require some form of collateral, such as personal savings and possessions of the business partners. Always, they will require detailed pro forma documents, indicating estimates of capital needs and time delay before profitability. If possible, interest bearing loans should be negotiated for long payback periods, since the time span for getting established and developing a clientele is relatively long compared to most service-oriented and retail businesses. Lenders tend to seek short-term contracts so that the money can be made available for other investments and interest rates can be maintained in the range of the current market.

A rehabilitation engineering service is a new concept in the investment marketplace. However, it has significant public relations appeal because of its clientele. Properly packaged, it may be able to attract one-time commitments of money for which no direct payback is expected. Government agencies, private foundations, or coalitions of private sources that will utilize the service may wish to seed the development of the service with a one-time grant. Philanthropic sources may see it as a meaningful community resource to which they would contribute either facilities or equipment. Related businesses, such as hospitals and medical and home health service providers, may see it as a desirable adjunct to an existing program and offer time-or-performance-dependent support. Keep in mind that many grant-funding agencies, especially government ones, may require some form of matching support, either in dollars or in kind.

It should be emphasized that relationships with funding sources are essential components of sound business practice and should be carefully nurtured. No source of start-up funds should be thought of as a one-time source. Each should be kept closely informed about progress of the company, particularly the successful events. Marketing efforts of the business should always consider the start-up funding sources as well as the ongoing client referral and reimbursement sources.

Identifying and Pricing Capabilities

The previous section explored the need for identifying costs involved in starting up a rehabilitation engineering program and investigated some sources of funding that might be sought in getting the program off the ground. Of course, the ultimate goal is to move the program beyond the initial stage of development to a more stable position as an ongoing, self-supporting operation. There is a limit to the amount of venture capital, grants, and other seed money. As soon as possible, a program must begin supporting itself with revenue generated through operations. Ideally, enough revenue will be generated to cover total program costs plus enough additional return to allow program profit and growth. At the very least, there must be sufficient revenue to lend some stability to the program and to minimize the need for supplemental fund raising simply to perpetuate the program.

Many components of a rehabilitation engineering program are potential revenue producers. The trick is to **realize** some of that potential, a task that requires both creativity and, in many cases, perseverence. Creativity is needed to identify and combine billable services as sources of revenue. As is outlined below, there are a number of possibilities. Developing those services into forms that are attractive to the marketplace requires perseverence, flexibility, and objective analysis of the needs of the payers.

Conceptually, there are three basic categories of potential revenue producers. Those are 1) the products that are supplied through one's program, 2) direct client/patient services, 3) client/patient services, and 4) indirect services.

Product Revenue

In most cases, a basic service is the recommendation and/or supply of equipment that has been produced elsewhere. Chapter Three introduces a rule of thumb which holds that 60% of a program's "hardware" output should be off-the-shelf commercial products, 30% modified commercial products, and no more than 10% should be customized devices. This rule of thumb was suggested for sound service delivery and financial reasons. In addition, it means that one's program will frequently be performing a role of commercial product supplier.

Conceptualizing one's program as a product supplier is useful. It suggests that revenue might be generated through supply of products manufactured elsewhere. Serving as a commercial product supplier, however, typically will require gaining authorization from individual manufacturers/distributors and may involve training/familiarization with those company's product lines. In some cases it may be difficult to attain authorization and associated dealer discounts, particularly if a manufacturer already has significant supply of authorized dealers in the area.

An equipment supplier does not sell a product for the same price at which it was acquired from the manufacturer/distributor. Instead, the retail price includes a markup. That price usually consists of 1) the wholesale price, 2) any direct costs incurred by the supplier in marketing and delivery of the product, 3) some indirect costs such as overhead and administrative expenses, and 4) some reasonable return on investment. The gross margin, that is the margin before taxes between a wholesale/distribution price and a retail price, may vary from product to product within a supplier's product line. The gross margin may range from 15% to 50% of the retail price, with a rule of thumb being around 35% to 40%.

Ideally, this should be no different for a rehabilitation engineering program than for any other product-vending business. The program is not just rendering technical services. Commercial products are also being provided and costs are incurred that are directly attributable to the provision of those products. Furthermore, since sale of those products requires other organizational resources, the revenue from their sale should include a proportional share of the program's indirect costs as well as a percentage of the return needed to support organizational growth. Costs that are not recovered through price markup must be charged to other potential revenue producers or covered through supplemental fund raising.

If commercial products are purchased wholesale in large enough volumes, a program may be able to command manufacturer/distributor discounts. This might either allow greater portions of a product's markup to go toward indirect program costs or it may lend greater flexibility to the program in its product and service pricing. Again, such discount arrangements are usually reserved for a manufacturer's authorized dealers.

Product/Service Pricing

At this point, it is useful to discuss pricing of products and services. Heretofore, we have emphasized the importance of marking up the price of products purchased elsewhere to include other costs of doing business. Such markups, however, should be made carefully. A marked up price is also the price at which a program offers its product and its value-added services to potential clients. The price that is charged will influence the number of persons who will seek those products and services and will be very important to successful performance in the marketplace.

Product markup, or service markup for that matter, should not be done unilaterally, where program administrators consider only internal costs. Instead, arrival at an optimal markup price is very much of a balancing act. Attention should be given both to internal costs and to a price that the external market will bear. If it becomes clear that a price, although accurately reflecting total costs to an organization, translates into a price that is untenable in the marketplace, program officers must find ways to cut or reallocate costs in order to charge a more acceptable/competitive price.

In many cases there will be uncertainty about what price is acceptable in the market. Program planners may be able to get some idea of price sensitivity by studying pricing patterns of similar programs or by surveying a sample of the target market. That may reveal some overall price parameters. Unfortunately, too often

rehabilitation engineering/technology programs have tended to charge prices that undervalue the costs involved in delivering the service. This makes it suspect to use prevailing prices to guide one's own pricing structure. Therefore, settling on a price may require trial, error, and readjustment. A rule of thumb holds that it is better to test uncertain waters with a price that is too high rather than too low. If experience shows that the initial price is not optimal, it is easier to lower that price than to try raising it. Chapter Two further explores the art of pricing.

Direct Client Service Revenue

Many of the specialized rehabilitation technology services that can be offered are closely related to the provision of a product, but not all can be included in the price of the product. Common examples of such product-related services include:

1. evaluation and assessment,
2. design, selection, or specification,
3. modification, fitting, or installation,
4. training the user,
5. servicing, maintaining, or repairing, and
6. follow-up evaluation and revision.

In many other businesses, a mechanism for reimbursing the costs of such services can be built into the price of the product. In the rehabilitation reimbursement market, as we know it today, that is not usually possible. Most reimbursement authorities, by written policy, do not pay for these services in the product purchase, if they are aware that such cost is being included. Since most payers demand competing bids and detailed pricing reports from their suppliers, it is not likely that service costs can be built into the product price. Competitors may remove these costs in order to leverage the sales price downward, hoping to recover some of it through increased market volume or other means.

Some of the product-related service costs can be billed separately, although often under other professional banners. Rehabilitation engineering labor is not currently recognized as a reimbursable item by most of the payers, so labor costs may have to be billed as therapy or prosthetics/orthotics service. For example, assessment of functional need and user performance as well as user training might be billed as the service of an authorized therapist, if such a person is on the staff. Modification and fitting can be identified as orthotic functions. Maintenance, repair, and follow-through can sometimes be sold as separate or contracted services. Payment-claims personnel who manage the disbursement of client service funds are accustomed to paying for these types of professional services and have established customary rates for each category. In a way, therefore, the reimbursement rates for product-related services have already been fixed in the marketplace. It is not practical to think of charging more than this prescribed rate, even if the real value of the skilled service is higher. Other means of recapturing labor costs must be devised.

Indirect Service Revenue

Although the majority of program resources will tend to be devoted to providing products and services directly to clients, it is unlikely that they will be used for those purposes 100% of the time. Program resources should not sit idle. The technical expertise of your staff, your equipment, and other resources have value beyond what

they can provide to clients. There are numerous ways that those can be used to generate additional revenue when not used for direct services. They might be used for marketing, consultation, inservice training, information brokering, demonstration, referral, and a host of other possibilities. The options are really only limited by the bounds of creativity. Perhaps the best way to describe the range of possibilities is by presenting a series of actual case examples.

- In addition to providing training, orientation and rehabilitation services to blind and visually impaired computer users, the STORER Center of the Cleveland Society for the Blind periodically provides inservice training on a contract basis to counselors of the Ohio Bureau of Services for the Visually Impaired.
- The Assistive Device Center, California State University at Sacramento, pursues research and development grants, which are conducted by Center personnel when they are not involved in direct client service delivery. They also conduct training workshops for professionals in the Center's service area. The Center also markets software and information, including a computerized Assistive Device Database System (ADDS). These indirect services are all part of the ADC's "Resource Center Services," one of three organizational components.
- The (Re)Habilitation Technology Service Delivery Program at Gillette Children's Hospital in St. Paul, Minnesota, provides onsite education to students from various academic institutions. The program trains orthotic and prosthetic technicians and practitioners from the Northeast Metro Technical Institute, orthopedic surgeons from the University of Minnesota Medical School, orthopedic surgeons and physiatrists from the Mayo Clinic, and rehabilitation engineers from the University of Virginia.
- The Schneier Unit is a component of the Adaptive Services program of the United Cerebral Palsy and Handicapped Children's Center of Syracuse. The Unit provides a range of technical services to its constituency, including augmentative communication and computer applications. It operates completely under fee-for-service arrangements, a significant portion of which are generated through indirect services. The Unit sponsors regional workshops providing inservice instruction to clinicians, academicians and other groups. Inhouse inservices are also provided to allow professionals to visit the Unit and observe operations. The program director provides consultation services on a fee basis to other programs. The unit also is involved in developing software, databases, and resource directories which are marketed for additional revenue.

These examples are not meant to be exhaustive, but rather are intended to stimulate creativity in planning for maximum use of organizational capabilities for generating revenue to support nonreimbursed program operations.

Provision of indirect services probably will involve additional costs, such as development/printing of training materials and marketing of services. As was emphasized earlier, direct costs, as well as a percentage of indirect costs, should be included in the prices charged for the services. However, if a program is able to use excess resources efficiently by providing indirect services, there is a greater ability to spread indirect costs across a larger number of revenue-producing services, effectively lowering unit costs for each.

The precept of charging for indirect services is somewhat alien to the rehabilitation field. Yet, as emphasized throughout this document, a rehabilitation technology service should be founded on sound business principles. Costs should be reimbursed with revenue. If someone conducts a site visit to learn more about how your program is operated, or someone receives training from your personnel, those represent costs to your program. Presumably, those occasions are also of value to the recipients. Therefore, program officers should not hesitate to charge for the costs involved in rendering indirect services. Since we as a society have traditionally received those free of charge, some bad feelings may result initially. However, as administrators increasingly adopt better business postures, society will revise expectations and begin to pay for those services based on their perceived value.

Generating Revenue: Identifying and Cultivating Payment Sources

This section of the chapter shifts focus from the delivery to the payment side of the equation. The previous sections are concerned primarily with an internal focus, investigating an organization's startup needs and exploring its capability to deliver potential revenue-generating products and services. This section considers how and where that revenue might originate and what it might buy, topics that require shifting to an external market focus.

Realistically, considerable thought should already have gone into identifying potential sources of payment well before this point in the planning process. Since planning is an ongoing iterative process, we can assume that program officers have given concurrent consideration to both a program's internal and external possibilities. The limits of the written medium require that this document treat the two areas sequentially. It should be emphasized, however, that examination of potential payment sources is an integral financial planning responsibility.

Identifying Payment Sources

A prerequisite to generating revenue is identification of one's "target market." Just as an organization must plan its internal operations, it is advisable that thoughtful planning go into identifying and understanding one's business environment, particularly those segments that represent potential sources of program revenue and those that represent competition and politics. There are three fundamental questions to consider when identifying potential sources of payment:

1. What will our program be selling?
2. To whom will we be selling?
3. What drives the buyers, and what are they likely to buy?

What Will Our Program Be Selling?

This question has been considered to a degree in the previous section when exploring internal program capabilities. It is essential to reexamine those capabilities from a market standpoint, looking at what one's program will have to offer of value to potential clients.

What does your program have to offer and how will it be sold? Will you focus on selling "hardware," including the costs of the services you render as value added to that equipment? Will services you provide be bundled into some defined intervention (e.g., a visit, a unit of time, etc.) or will you charge separately for each service (e.g., assessment, training, repair, etc.)? Will you sell your services as an outcome (e.g.,

for X dollars we will help an individual perform a certain job)? As these questions suggest, there are various ways to define what it is you plan to sell. Referring to your product as "rehabilitation engineering" or an equally vague description may not conjure up the desired image among potential customers. It is important, therefore, to define what it is you have to offer in terms that are understandable, sellable to the prospective buyer, and reimbursable within that buyer's regulatory structure.

To Whom Will We Be Selling?

On the surface, this may seem an obvious question. The nature of the typical market for rehabilitation engineering/technology, however, is such that identifying the "customer" is difficult. Establishing and nurturing a direct relationship with each purchaser can be a complicated process.

Table 5-1 inventories some potential sources of payment for rehabilitation engineering/technology.

TABLE 5-1
Potential Sources of Payment for Rehabilitation Engineering/Technology

Children's Service Agencies
- Employers
- Medicaid
- Medicare

Personal/Family Resources
- Philanthropic Groups
- Disability Related Organizations
- United Way
- Other Charitable Groups

Private Insurance Carriers
- Health Care Insurance
- Disability Insurance
- Liability Insurance
- Workers Compensation

Special Education Agencies

Vocational Rehabilitation Agencies

Veterans Administration/CHAMPUS

As Table 5-1 suggests, third parties are a substantial segment of the market for rehabilitation technology. This is partially attributable to the relatively high cost of delivering rehabilitation products and services, and partly because extraordinarily large numbers of potential technology users have relatively limited financial resources. That is not to suggest that consumers do not pay directly for these products and services, because some do. In fact, it is argued by some that private pay segments of rehabilitation technology markets hold significant potential as heretofore underdeveloped sources of payment. Despite the potential of private pay, however, third-party payment remains a pervasive force within the rehabilitation technology marketplace. Further, it is quite common for reimbursement to be shared by more than one funding source.

In this marketplace, the value of a given package of products/services typically must be demonstrated to a number of persons, each with some voice in deciding whether or not to pay for that package. Some are involved with selection/prescription, some with payment. Instead of one group of individuals involved in a purchase decision (e.g., the technology user and perhaps family members), there may be as many as three groups, including rehabilitation/medical professionals and third-party payer representatives. The following is a sample listing of persons to whom a rehabilitation engineering program might need to sell its services:

- Directly to consumers, family members, friends
- Professionals
  - Physicians
  - Therapists
  - Counselors/Case Managers
  - Attorneys
- Third-Party Payer Representatives
  - Claims Level Persons
  - Policy Level Persons
  - Philanthropic Agency Personnel

What Drives the Buyers and What Are They Likely to Buy?

This is a pivotal question when considering how to generate revenue from program operations. There is an art to forecasting what one's target market is likely to buy. A variety of theories related to consumer buying behavior have been developed and can be found by the interested reader in conventional marketing literature. However, the rehabilitation product consumer(s) behave differently in some respects.

Forecasting buying tendencies within markets for rehabilitation engineering services can be particularly challenging since so many different individuals may be involved in any one purchase decision. Certainly, a segment of the market will tend to conform to conventional theory. The private pay segments, for example, seem fairly representative of traditional economic marketplaces, where the product/service recipient is also the payer. Segments of the market that are pervaded by third-party payment, however, are atypical and therefore uniquely challenging.

Although more of a political than a policy topic, one must be aware of the motivation of the person who makes the reimbursement decision. Few third-party payers spend money altruistically. Committing funds for client services is both a policy and a personal decision. Some of the reimbursement decision makers are exercising organizational directives and are dogmatically bound by policy. Many, however, realize they are affecting the quality of a human life with their decisions and are sympathetic to efforts to maximize the benefit that can be derived from the mosaic

of payment resources. The rehabilitation engineering service provider needs to keep this motivation at the forefront during negotiations with payer representatives. It is important not only to persuade the decision maker to allocate funds toward the provision of services for a client but also to reward that decision maker with credit for satisfactory results. Providing information about outcome can also help the payer make adjustments in rates and policies that will steadily improve the overall quality of the service they provide their clients. The development of a colleague-type relationship with the payer representative can foster the long-term growth and health of the business for both parties.

Having previously identified some of the key payment decision makers to whom your program must market its services, it becomes expedient to answer a series of questions related to those decision makers' value systems.

- What attributes of one's products/services might a person who is disabled find most valuable? Do the critical attributes change over time, as customers become more experienced consumers?
- How influential are family members in the purchase decision-making process? What criteria might they use in their decisions?
- What values are of importance to the various professionals who are involved? What is the professional influence on the purchase decision? Does that influence diminish as technology users become more experienced consumers?
- Finally, if certain customers are likely to seek payment from third-party programs, to what guidelines and values do those programs subscribe?

Although difficult to answer, these questions are critical to consider. Exploring them should provide some insights into basic assumptions about the revenue-producing capability of your program. At the same time, understanding the key criteria that may motivate persons to purchase your products and services should help you in your sales efforts. It becomes easier to promote the attributes of your products/services that are most important to each segment of your target market.

In some ways, it may be easier to forecast what or how to sell in markets that are driven by third-party payment. Many third-party payers rely on fairly predictable guidelines for payment decision making. Those guidelines might originate from legal/statutory requirements, formal program policies, or precedence. Of course, the human element is never absent from any third-party payment decision. Sometimes there can be a great deal of variance in payment by a particular program, which might be explained by the degree of latitude exercised by the individual decision maker. Yet there tends to be less variance and more predictability as to what a particular third-party payer looks for when determining whether to purchase or not to purchase.

It is useful to press this point a bit further by examining a few of the major third-party payment programs from the standpoint of their payment tendencies. The following profiles may be useful for two reasons. First, they provide some insights into general characteristics of major payment sources. Second, they portray a method of analysis that can be applied readily to other programs in one's particular service area.

Medicare

Medicare is a federal program responsible for purchasing medically necessary products and services for eligible beneficiaries. Established in 1965 as Title XVIII of

the Social Security Act, the program has two basic parts. Part A is the core part, covering primarily inpatient medical care. Anyone who is eligible for Medicare is automatically covered under Part A.

Part B is designed to supplement Part A. To be covered under Part B, an individual must enroll, pay a monthly premium and satisfy annual deductible and coinsurance requirements. Part B covers a wider array of medical benefits including physician services, other supplies and services incidental to a physician's care, various outpatient ancillary services, internal prosthetic devices, external braces, artificial limbs or eyes, and rental or purchase of Durable Medical Equipment (DME).

There are two principal categories of persons eligible for the Medicare program: persons who are 65 years of age or older and persons under age 65 who are eligible for the Social Security Disability Insurance (SSDI) program. There is an income criterion for eligibility under SSDI. Persons must be disabled to the degree that they are unable to perform substantial gainful activity (SGA), meaning they are unable to earn more than very marginal incomes. Roughly 90% of eligible Medicare beneficiaries fall within the former category and 10% in the latter.

Durable Medical Equipment is perhaps the most noteworthy Medicare benefit for rehabilitation engineering programs. DME is:

> "equipment which (a) can withstand repeated use, and (b) is primarily and customarily used to serve a medical purpose, and (c) generally is not useful to a person in the absence of an illness or injury, and (d) is appropriate for use in the home." (Medicare Carriers Manual, Section 2100.1)

In general, Medicare has avoided paying for technical services that are associated with delivery of a piece of DME, unless those services are included in the product's price. At the same time, it is often difficult to bundle too many value-added costs into any one price, since Medicare carriers generally establish allowable charges for a given type of equipment. The allowable charge is based on the actual charge that is submitted, the customary charge of the equipment supplier and a prevailing charge within the supplier's geographic area.

The Health Care Financing Administration (HCFA) administers the Medicare program at the federal level, but contracts out claims processing responsibilities to a number of private companies (termed "carriers" under Part B) around the country. HCFA develops regulations and general guidelines for the carriers to follow when reimbursing service providers and equipment suppliers.

This administrative framework suggests some decision-making latitude within the Medicare system. Congress sets overall policy, which is interpreted by HCFA, reinterpreted at the carrier level, and perhaps re-reinterpreted by individual claims processors.

Despite the existence of some decision-making latitude, two fundamental criteria exist. The first is that the product/service for which reimbursement is being sought must be medically necessary. A physician's prescription must be attached to every claim attesting to the product's/ service's necessity, and that opinion may be reviewed by medical professionals within the carrier as well. The second major decision-making criterion is cost. In recent years, Medicare has been extremely cost conscious, emphasizing payment for the lowest priced intervention that conforms to the medical necessity criterion.

Federal/State Rehabilitation

The Rehabilitation Act of 1973 and subsequent amendments establish the structure and overall goals of the federal/state rehabilitation program. Traditionally, the focus of the program has been primarily vocational training and placement. Title I of the Act calls for each state "to meet the current and future needs of handicapped individuals, so that such individuals may prepare for and engage in gainful employment to the extent of their capabilities." [Section 100 (a).] Since 1973, that focus has been expanded to include independent living (Title VII) and supported employment (Title VI, Part C).

Each state has an agency that is responsible for ensuring that vocational, independent living, and supported employment services are provided to that state's citizens with disabilities. Those services might be provided directly by the agency or contracted from another provider. Approximately half of the states also have a second agency with parallel responsibilities for persons who are blind or visually impaired. Agency budgets are provided through shared federal/state appropriations, with the federal share being in general around 80%. Every state is required to develop and periodically revise a three-year state plan outlining its goals and objectives for serving clients consistent with the broad goals established federally.

Primary responsibility for making decisions regarding purchase of necessary products and services for a given client resides at the counselor level. A rehabilitation counselor works with a client and family members to develop an Individualized Written Rehabilitation Program (IWRP). The IWRP documents the goals and objectives of the client and outlines interventions that will be used to attain those goals. Financing for necessary services or products might either originate from the individual counselor's casework budget or the counselor might help the client seek "similar benefits" from another source.

The core set of decision makers, then, are the rehabilitation counselor in tandem with the client and family. Of course, the ultimate decision must be consistent with overall state and federal policies. Some states institute policies specifically related to financing of equipment for individual client use. It is not uncommon for price ceilings to be placed on acquisition of vans, van modifications, or computer-related products, for example. As another example, in some cases device purchase might require general state competitive bidding procedures.

The Rehabilitation Act Amendments of 1986 have placed strong emphasis on greater incorporation of rehabilitation engineering/technology into the federal/ state rehabilitation system. The amendments define rehabilitation engineering/technology as:

> "the systematic application of technologies, engineering methodologies, or scientific principles to meet the needs of and address the barriers confronted by individuals with handicaps in areas which include education, rehabilitation, employment, transportation, independent living, and recreation."
> [Rehabilitation Act Amendments of 1986, Section 7 (12)]

The amendments include specific reference to rehabilitation engineering in sections dealing with State Plans, Individualized Written Rehabilitation Programs, and the Scope of Rehabilitation Services. These give clear signals as to the direction in which policy is evolving related to payment for rehabilitation engineering/technology by the federal/state rehabilitation system.

Medicaid

Medicaid shares some fundamental features with both the Medicare program and the federal/state rehabilitation system. Like Medicare, Medicaid is intended to meet basic health care needs of a segment of the U.S. population. In the case of Medicaid, the target population is "categorically needy" persons, defined as persons who qualify for various public welfare programs, such as Aid to Families with Dependent Children (AFDC) and Supplemental Security Income (SSI). Under some state Medicaid programs, "medically needy" persons are also eligible. Medically needy is defined as persons with income levels that are too high to qualify for welfare, but who are at risk economically because of excessive medical needs.

Like the public rehabilitation system, Medicaid is structured as a federal/state program. In 1965 the U.S. Congress established Title XIX of the Social Security Act setting up the Medicaid system. State participation in the system is voluntary, but today every state administers/supervises a Medicaid program. The federal government shares in the costs of each state program. The federal share is determined on a formula basis, not exceeding 50%. The Health Care Financing Administration (HCFA) is responsible for administering federal payments to states.

Title XIX sets forth a core group of medical benefits that every state Medicaid program must cover, including inpatient and outpatient hospital services; skilled nursing facility services; physician services; home health care services; physical therapy and related services; prescribed drugs, dentures and prosthetic devices; and other diagnostic, screening, preventative and rehabilitative services (Section 1905 of the Social Security Act). Beyond these core services, states have the discretion to provide a broader array of benefits. Most states have opted to cover DME and tend to use Medicare's definition and DME guidelines for setting their Medicaid policies. Some states have gone beyond DME coverage to include payment for some bathroom aids and communication devices, which are routinely denied as convenience items under Medicare DME guidelines. Of course, like Medicare, payments for any piece of equipment under Medicaid must be accompanied by a physician's prescription attesting to the equipment's medical necessity.

Two additional features of most Medicaid programs warrant attention here. The first is that, since Medicaid is intended for persons with very limited financial resources (often requiring persons to "spend down" to gain eligibility into the program), no coinsurance or annual deductible is charged. Medicaid will pay the total amount of what it determines to be the allowable charges. By the same token, product/service providers cannot legally charge additional costs to the Medicaid beneficiary. So, if Medicaid does not recognize all of the costs of delivering a product or service, one's only recourse is either to accept their payment and recover the other costs elsewhere if possible, or to not provide the service.

A second general characteristic of Medicaid is that most programs require prior authorization. Unlike Medicare, which determines allowable charges and reimburses after a service has been delivered, a service provider must submit a request for authorization to Medicaid before rendering the service. Obtaining prior authorization is a necessary prerequisite to obtaining Medicaid reimbursement, and in many cases it can expedite payment once the service has been provided. However, prior authorization does not guarantee reimbursement. There may be cases, for example, where a beneficiary loses eligibility to Medicaid between the time of prior authorization and the time that payment is requested.

Private Insurance

Private insurance is a term that describes an array of potential payment sources. It includes health insurance, liability insurance, long-term disability insurance, no-fault automobile insurance, worker's compensation, and other generic types of insurance. The common denominator is that these all are economic arrangements. In every case, a policy holder (e.g., an individual, an employer, etc.) purchases a legally binding contract from a private insurance company obligating that company to cover against loss to the policy holder or beneficiary as specified in the contract. In exchange for the insurer agreeing to accept the stated risks, a premium is charged to the policy holder.

The contract spells out the legal responsibilities of an insurance company, setting general parameters for payment decision making. A standard health insurance contract, for example, might obligate the insurer to pay for 80% of the costs incurred by a beneficiary for a hospital stay, physician and ancillary services, and perhaps some period of home health care. Likewise, a disability insurance policy might obligate a company to pay a beneficiary 60% or more of his/her pre-injury income in the event that he/she becomes disabled enough to be unable to earn income. These generalities suggest that understanding whether a private insurer will pay for rehabilitation engineering/technology is begun by understanding the types of contracts it sells, and the obligations it is accepting.

Of course, no contract spells out exactly how an insurer is to meet its obligations. There is rarely a clause, for example, that calls for rehabilitation engineering for a long-term disability beneficiary. Instead, each insurer has employees and other persons who represent the company and interpret its contractual responsibilities. Those individuals may be claims adjusters, claims supervisors, medical and vocational case managers, etc.

In addition to the terms of a contract, insurance representatives tend to place a great deal of value on cost effectiveness. They are concerned with the costs of products and services they buy, but they are also cognizant of the potential value of those services and sensitive to how they might minimize overall company responsibilities. This implies, for instance, that insurance representatives handling a worker's compensation or disability case might invest in rehabilitation engineering services if those can help a client regain employment and absolve the insurer of its long-term responsibilities.

These profiles have, by necessity, been fairly general. They do, however, represent an approach to analyzing the payment potential of third-party programs. Persons planning establishment of rehabilitation engineering/technology programs are encouraged to conduct similar, if not more detailed, analyses of payment sources within their target markets.

Hopefully, the very general level of understanding portrayed here will be surpassed quickly by program administrators as they begin to deliver products/services and subsequently to seek payment. As is emphasized in the following, understanding the nuances of third-party payment can be an ongoing responsibility as a program cultivates long-term relationships with the various payers.

Cultivating Payment Sources

Despite the diversity among third-party payment programs such as those profiled above, there is one important common denominator. The thread common to any payment source is its reliance on individuals for decision making. No matter how steeped in policies and procedures, no payment program can totally divorce the human element from its payment decision-making process.

This has important implications for rehabilitation engineering/technology service delivery programs. It becomes essential that program administrators not only identify but also cultivate relationships with the various payer representatives within one's service area. As emphasized at the start of this chapter, experience has shown the value of employing at least one person who is responsible for pursuing payment for services rendered. Cultivating relationships with payers is a central component of that person's job.

Cultivating a relationship involves establishing two-way communication whereby program administrators can better understand payment policies and decision-making constraints, and whereby payer representatives can better understand what products and services your program has to offer. That communication should be ongoing, including providing follow-up information (pictures, testimonials, etc.) regarding the benefits that were accrued for any given client as a result of the payer purchasing your products/services.

The following excerpt from an article by Leyrer (1987) encapsulates some useful strategies for cultivating relationships with Medicaid or any other payment source:

How to Improve Medicaid Relations

Dealers should make every effort to use all accessible information from Medicaid agencies regarding program coverages and limitations. The following suggestions should be considered.

- Subscribe to your state's Medicaid manual to assure receipt of all updates and changes that are enacted.
- Establish contact with the person within a state agency who is responsible for prior authorizations.
- Become acquainted with the state's requirements for approving equipment and paying claims.
- Make an appointment to visit the Medicaid office, if possible, and invite Medicaid staff members to visit and tour your dealership. Informal observations of an office or business can do wonders to improve relations and establish an appreciation of the job faced by the other party.
- Request a visit from a provider representative when particular problems recur. Medicaid agencies and their fiscal agents are usually happy to spend time helping resolve problems before they become insurmountable.
- Some states, like Nevada, hold free workshops each year to inform providers of program changes and to assist billing personnel and office managers in claims processing problems. Send staff members to these events as often as possible.

You may find additional strategies that work effectively. The important point is that developing a rapport with third-party payer representatives is an essential investment for any service delivery program. Those representatives should be treated just like any other potential customers, with perhaps even more attention to follow-up, since they rarely receive information substantiating the value of their purchase after it has been made. That type of feedback, as part of an ongoing relationship with payers, can provide valuable quality assurances to payers, expediting future payment decisions.

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CHAPTER SIX:
BUSINESS PRACTICES IN SEATING SERVICE DELIVERY: A REHABILITATION TECHNOLOGY CASE STUDY

Hugh O'Neill

Introduction

Seating services appear to be the most financially established and widespread of all the rehabilitation technologies. Seating service delivery providers and product selection both have grown dramatically in the past few years. Perseverance by the early service providers and research on the effectiveness and benefits of proper seating have resulted in both more demand from the community for these services and an increased willingness on the part of third-party payers to fund these services. In addition, product improvements and the introduction of new modular products and custom fabrication techniques have enabled new providers to get into the field without a major investment in facilities and the labor-intensive techniques that the previous technology required. An increase in the number of providers would seem to be a natural consequence of improved reimbursement policies, in particular, and improved seating technology.

In order to provide information on how service providers have organized their facilities (i.e., staff level, staff mix, type of products, etc.) in response to a competitive environment and various funding policies, a survey of established seating service providers was conducted. The survey was designed to elicit information in five areas for each provider:

- the number of clients and size of region served;
- the types of products offered;
- the competitive environment;
- staff size, compensation and formal training; and
- simplified financial report.

Forty-five questionnaires were distributed to service providers in the United States who had been providing seating services for at least two years. Seventeen facilities returned the questionnaires. These represented four types of service providers: Durable Medical Equipment Suppliers (DME), Prosthetic and Orthotic Facilities (P&O), Rehabilitation Engineering Centers (REC), and Hospitals. Results from an additional 12 have been received, and the results appear to be essentially the same. A full report of the study will be available as of December 1987, from the author.

The DME suppliers and the P&O facilities can be readily assigned to the service delivery models described in Chapter One. DME suppliers are one of the models described in Chapter One, and the respondents who identified themselves as DME suppliers appear to be consistent with the model in terms of staffing characteristics, types of services offered and overall organization of their businesses. Similarly, although P&O is represented in six of the seven models, the P&O facilities appear to

be most closely defined by the Private Rehabilitation/Technology Firm model. They generally have smaller staffs who are highly trained in a particular clinical discipline and offer services that are consistent with their traditional clinical approach and which utilize familiar materials and fabrication techniques.

Two of the respondents identified themselves as hospital-based programs and do appear to be organized as "Departments in a Comprehensive Rehabilitation Program." The four facilities who identified themselves as RECs, however, are more difficult to characterize according to the described service delivery models. Two of the RECs are affiliated with universities and appear consistent with the model for Technology Center in a University. The other two RECs do not adhere strictly to any single model. They display some of the characteristics of Technology Center in a University, Department in a Comprehensive Rehabilitation Program, and Private Rehabilitation/Technology Firm in their staff training and emphasis, scope of services offered, geographic regions served, and general business organization. Both of these RECs are hospital based without any formal university affiliation; however, they appear to function relatively autonomously from the hospital and, in one case, offer significant services to clients outside of the hospital program. Since these facilities identified themselves as RECs and there was not sufficient information in the questionnaire to arbitrarily assign them to a different model of service delivery program, their responses have been grouped with those of the two university-affiliated RECs. When the response of any service provider differs significantly from the responses of the other providers in any model, they will be noted and discussed.

The number of respondents represents a relatively small statistical sample. The overall data do suggest certain trends among all the providers and, in many cases, there are notable differences between the various types of providers in how they have organized their businesses and the types of services they provide. However, one should be cautious in drawing absolute conclusions from these data. Where numerical data are given, the median has been calculated rather than the mean or average. The median is derived by listing all of the numerical responses for a given category and then eliminating the highest number and the lowest number, then the next highest number, then the next lowest number, until a single number remains. This number is in the middle where an equal number of responses were higher than the median as were lower than the median. In most cases the range of the responses from the lowest to the highest number is also given. Data for a typical service provider in each category is shown in Figure 6-1.

Provider Backgrounds: General

Seven years is the median time that the 17 respondents have offered seating services, with a range of 2 to 39 years.

A total of 3,497 clients are served each year by these 17 providers with a range between providers of 5 to 1,200 clients per year. The median number of new clients seen each year is 86 as compared with 48 repeat clients.

There were some notable differences in the number of clients served and in the ratios of new clients to repeat clients between the various types of service providers which is probably due to the length of time the providers have offered seating services. The four RECs and the two hospital-based programs have been in existence for a median period of 11 years and 7.5 years respectively. The DME suppliers have offered services for a median of 5.5 years and the P&O facilities for 4.25 years. The ratio of new clients to repeat clients for the RECs and hospitals was approximately 1.5:1. The DME suppliers, which have offered seating services for slightly longer than the P&O facilities, have a ratio of approximately 3.4:1 while the relatively

Figure 6-1

PROFILE OF A TYPICAL SERVICE PROVIDER FOR EACH CATEGORY SURVEYED
(Seating and Positioning Service Providers)

	DME Supplier	O&P Facility	Rehabilitation Engineering Center	Hospital
Clients served per year:	146	60	180	160
Ratio of new clients to repeat clients:	3.4 : 1	5 : 1	1.5 : 1	N/A
Years in business:	5.5	4.25	11	7.5
Major products:	central fabrication foam & plywood Pin Dot modular Safety Travel MPI/CP seat	central fabrication foam & plywood Pin Dot modular	foam & plywood foam-in-place in-house modular Pin Dot Modular	central fabrication foam & plywood moulded plastic Pin Dot modular Otto Bock
Client distance from facility:	75% less than 50 miles 95% less than 100 miles	75% less than 50 miles 90% less than 100 miles	75% less than 25 miles 93% less than 100 miles	63% less than 100 miles
% of services offered outside facility:				
evaluations:	82% (20% - 99%)	75% (10% - 90%)	10% (10-20%)	<15%
fabrication:	10% (10% - 70%)	1% (1% - 90%)	<10%	—
fittings:	50% (10% - 99%)	83% (5% - 100%)	3% (1% - 5%)	5%
repairs:	23% (10% - 60%)	50% (3% - 90%)	<5%	10%
Number of employees:	6.5 (3 - 9)	4 (1 - 7)	7.25 (4 - 9)	4.5 (2 - 7)

young P&O facilities have a ratio of almost 5:1. This is probably due to the P&O facilities and the DME suppliers continuing to build their service by attracting new clients and new referrals from the community, while the RECs and hospital-based programs have already tapped most of the available market in their areas. The P&O facilities and DME suppliers also reported a greater emphasis on marketing, which seems to pay off in increased referrals.

In addition, the types of products most commonly offered by the DME suppliers and P&O facilities are relatively new products within the past two to three years which tend to complement the types of services already offered by these providers. As a result, DME suppliers and P&O facilities are more comfortable with these products and/or fabrication techniques and may, therefore, be more encouraged to aggressively market seating services. In contrast, the RECs and hospital-based programs appear to be remaining with the older and more established technologies and have not adopted the newer central fabrication and modular components to any significant extent. (Central fabrication in this context can de defined as a custom fabrication, such as an orthosis or a seating system, produced by an establishment outside of the suppliers facility, from a cast or measurements that the supplier furnishes.) The fact that these providers are not marketing "new" products, which would attract additional clients, and the fact that they are probably already serving the majority of the clients in their area who would benefit from their services, lends confidence to the lower observed ratio of new clients to return clients as reported by these providers.

The 17 providers surveyed serve clients from 25 different states. United States regions represented include the Atlantic States, the Midwest, the South, the West coast and the Pacific Northwest. Nine providers serve clients from more than one state, with a range of one to four states served. The surveyed providers each draw more than 50% of their clients from at least one of the following states: California, Illinois, Kansas, Michigan, Minnesota, Missouri, Nebraska, New York, Tennessee, Virginia, and Washington. Clients from these states are 85% of the providers' total client base.

With the exception of the hospital-based programs, all of the providers reported that 95% of their clients lived within 100 miles of the facility. The two hospitals seemed to draw a significantly greater number of clients from beyond 100 miles with the median percentage of 37% in a range of 20% to 55% coming from beyond 100 miles. Both hospitals reported that 65% to 78% of their referrals came from inhouse. Since both hospitals reported similar types and numbers of seating service competitors within 75 miles of their facility, it is likely that the higher number of clients attracted from beyond 100 miles is due to other inpatient and outpatient services offered by the hospital. Once the clients have been referred to the hospital it would then be logical to refer them to the inhouse seating service, if the services were needed.

Financial Performance

The respondents were requested to complete a simplified financial statement which was included in the questionnaire. Unfortunately, most of the respondents declined to provide the financial information, and there were insufficient responses available from which to draw any meaningful conclusions. This is unfortunate since the financial performance was a key element of this survey and would have provided a framework from which to evaluate the relative effectiveness of the various business structures and approaches to service delivery. In order to provide at least some objective framework for evaluating the facilities' various service delivery

programs, follow-up phone calls were made to those respondents who had originally declined to provide the complete financial statement. Their responses were combined with the financial statements of those who did provide them and the results are summarized in the accompanying table. Responses were thereby available for 14 of the 17 respondents in this survey.

Financial Performance of Service Providers (Prior Year)

	DME	P&O	REC	Hospitals
Number with Profits	5	3	0	1
Number with Losses	1	0	0	1
Number who Broke Even	0	0	3	0

Significantly, all but two of the respondents reported that seating was either profitable or breaking even, with two-thirds of the respondents reporting a profit. Not surprisingly, all but one of those who reported profits were the more business-oriented DME suppliers and P&O facilities. One of the suppliers commented that if seating was not profitable they would not offer it as a service.

Both programs that reported a loss were responding to the problem primarily by changing their staff mix and reorganization of their methods of delivering services. The DME supplier who reported a loss had been in business for approximately four years. This facility had reduced its staff and had reorganized its business procedures to increase efficiency and the number of seating systems in progress at a given time. They reported that they were hopeful that these changes would result in a profit in the current year. The hospital that reported a loss had been offering seating services for approximately two years. The hospital was in the process of hiring a technician to augment the professional staff, and thereby increase the number of seating systems that they could provide and the cost effectiveness of providing these systems.

The most common problems cited by all of the respondents were staff time and, hence expense, associated with delivering services; poor reimbursement rates; and excessive delays in obtaining reimbursement from third-party payers. Labor costs in particular appear to be a critical factor in determining the ultimate profitability of delivering seating services. As will be discussed later, the RECs that tend to provide more labor intensive types of services all reported only that they were breaking even. In addition, the two facilities which reported a loss in the prior year and the comments from those facilities that are now profitable but had experienced losses in the past, generally blamed the losses on labor expenses. This is further reinforced by the comments from some of the respondents who specifically stated that the products themselves were profitable but that the labor associated with delivering them could often cause an individual case to result in a loss.

A second problem, especially for the smaller businesses and those just beginning to offer seating services, is poor cash flow. Lengthy delays in obtaining reimbursement from third-party payers can create a significant short-term loss. The facilities must pay their suppliers for equipment which they have bought and provided to clients, and they must pay staff salaries far in advance of the time when they receive reimbursement for these services. In some cases, delays can range from several months to more than a year. While the provider may ultimately be reimbursed at a rate that generates a profit, the provider must have sufficient reserve funds to cover expenses in the meantime.

Accurate pricing of services is also a critical factor in the ultimate financial performance. One DME supplier reported that they had suffered a large loss a few years prior to the survey. They had responded by increasing their prices and preparing supporting documentation to justify their new prices. They presented the supporting documentation to their third-party payers and reported that their seating services are now a profitable part of their program.

Services Offered

Survey respondents were questioned as to what types of services they offered based on the following list of defined services:

Assessment of need - determine whether, and to what extent, the client will benefit from seating, the seating goals, and the physical characteristics of the seating system.

Consultation on seat configuration - determine the specific manufacturer or components necessary to accomplish the seating goals and which will work within the client's environment.

Custom inhouse fabrication - custom seating fabricated at the service provider's facility.

Custom central fabrication - custom seating fabricated at a central fabrication facility from measurements or a plaster impression of the client provided by the service provider.

Modular components (sales) - sales of prefabricated modular components without necessarily being responsible for fitting and adjusting the system.

Modular components (fitting) - fitting and adjusting the prefabricated modular components to the exact needs of the client.

Follow-up - at least one follow-up visit to verify that the seating system is functioning and being used properly.

Postural seating - seating intended to provide postural support or positioning to enhance an individual's functional abilities.

Pressure-sore prevention - seating designed to minimize an individual's risk of developing pressure sores (decubitus ulcers).

All of the providers surveyed offered assessment, consultation on seat configuration, sales of hardware and follow-up. Most of the providers also offered at least some inhouse fabrication and at least some fitting of modular systems.

All of the DME suppliers and most of the P&O facilities performed a significant percentage of their evaluations and fittings outside of their facilities. In contrast, the hospitals and the RECs provided a very low percent age of these services outside of their facilities. The hospitals generally draw most of their client referrals from inhouse and would, therefore, not be organized to provide services outside of the facility. In the case of the RECs, a much higher percentage of their client referrals are from outside of the facility; however, the predominant product mix that they offer is labor intensive, inhouse, custom-fabricated seating systems which do not readily lend themselves to being provided outside of the facility. Three of the RECs do perform 10-20% of their evaluations outside of the center; however, only two of the facilities do any fittings outside of the center and these are generally less than 5% of their total. For all respondents, the median percentage of seating delivery services provided outside the provider's facility was as follows:

35% of evaluations, with a range of 10% to 99%
10% of fabrications, with a range of 1% to 90%
25% of fittings, with a range of 1% to 99%
20% of repairs, with a range of 3% to 90%

Product Mix

Custom-fabricated seats are seating systems that are produced from raw materials such as foam and plywood, vacuum-formed plastic, foam-in-place, or modular components that the providers fabricate themselves at their facility. Custom-fitted modular seating systems are prefabricated modular seats with adjustable hardware to achieve a custom fit. These types of seats often offer a wide range of adjustments and optional components, which a skilled clinician can use to produce a very effective custom fitted seat system. In general, the custom-fitted modular systems are less labor intensive on the part of the service provider and require less of an investment in shop space and facilities.

The RECs do not use central fabrication facilities for their seating systems. Ninety percent of the services that the RECs offer are either from foam and plywood, foam-in-place or inhouse fabricated modular systems, or a combination of these technologies. Only one of the RECs offered any type of custom-fitted commercial modular seating system. All six of the DME suppliers and four of the five P&O facilities offer custom-fitted modular seating systems. The DME suppliers derive 70% to 80% of their custom-fitted modular business from one or two product lines which they concentrate on marketing. The various suppliers have selected the one or two products that they offer from among approximately six that were most commonly cited in the survey and which appear to represent the majority of the total sales in the custom-fitted modular seating market.

All of the DME suppliers and most of the P&O facilities also offer custom fabricated seating systems. Sixty-five percent of the custom-fabricated seating offered by the P&O facilities is through central fabrication and 22% is from foam and plywood techniques. The DME suppliers utilize central fabrication for approximately 43% of their custom fabricated seats, and foam and plywood for approximately 34% of their seats. Central fabrication is a common technique in other aspects of prosthetic and orthotic service delivery and would reasonably be expected to be readily adopted for seating service delivery by these types of service providers. It was not possible to determine the ratio between custom-fabricated seating and custom-fitted modular seating provided by each of the service providers.

Referral Services

On the questionnaire, respondents had the following referral sources from which to choose: inhouse, other hospitals, non-hospital therapy unit, community physicians, private therapists, schools, independent living centers, vocational rehabilitation agencies, client self-referrals, Muscular Dystrophy Association, United Cerebral Palsy, Easter Seals, and others (e.g., nursing homes).

The median number of referral sources was 7, with a range of 1 to 11. The sources that were used the least were Easter Seals, nursing homes, and independent living centers. Although nursing homes were cited by only one P&O facility, they accounted for 35% of the referrals to that facility. The facility declined to supply financial information so it cannot be determined how well they were being reimbursed; however, they had been in business for several years and were reporting ap-

proximately 80% of their reimbursement from Medicaid or Medicaid/Medicare crossover.

The DME suppliers' and P&O facilities' referral sources reflect the traditional sources of referrals for each of these providers. Both draw equally from schools; however, the DME suppliers draw primarily from institutions such as other hospitals, rehabilitation facilities and the Muscular Dystrophy Association, while the P&O facilities rely on individual relationships with physicians and private therapists for a significant number of their referrals. In contrast, neither community physicians nor private therapists accounted for more than 7% of the referrals to the DME suppliers.

The hospital-based providers rely primarily on inhouse referrals although 25% to 35% are outside referrals, primarily client self-referrals, with 5% each from community physicians, private therapists and the schools.

The RECs, which are often affiliated with a hospital or medical center, also rely on inhouse referrals; however, these are generally only about 40% of their referrals. Two RECs reported that they were part of a hospital and one of them reported that 100% of its clients were inhouse. The other REC obtained approximately 20% of their clients from inhouse and the third REC that provided a percentage breakdown was not part of a hospital and reported that 20% of its clients came from other hospitals.

Most of the DME, REC and hospital-based providers reported five to nine referral sources per provider. The P&O facilities, however, reported only two to three referral sources per provider for the three facilities which had offered seating services for less than three years. The two P&O facilities which offered seating services for seven or more years reported 9 to 11 referral sources for each facility. It appears that the relatively younger P&O facilities are building their seating delivery service on their traditional non-seating referral sources, and that as the business matures they gradually make inroads into the wider range of referral sources utilized by the other service providers. The breakdown of referral sources by type of provider is as follows:

DME Suppliers: schools (25%), other hospitals (17%), MDA (16%), and rehabilitation facilities (13%);

P&O Facilities: schools (22%), private therapists (21%), community physicians (17%), and other hospitals (11%);

Rehabilitation Centers: inhouse (40%), non-hospital therapy units (22%), other hospitals (10%), and community physicians (8%);

Hospitals: inhouse (72%), client self-referrals (13%), schools (5%), and vocational rehabilitation agencies (4%).

Competitive Environment

Most of the facilities reported at least three types of competitors within 75 miles of their own facility. Only one of the respondents, a REC, reported no competitors within 75 miles. The most common competitors cited were DME suppliers. All of the facilities with competition within 75 miles reported that at least one of the competitors was a DME supplier. Approximately two-thirds of the facilities reported that a P&O facility was also offering competitive seating within 75 miles. Slightly less than half of the respondents reported the presence of a hospital-based competitor or rehabilitation facility within the 75-mile limit. Only one of the respondents

reported that a non-hospital therapy unit was offering seating services within 75 miles of their facility.

There appears to be a significant interest in seating service delivery and a growing number of service providers in this field. All of the providers surveyed drew most of their clients from within 75 miles of their facility. The fact that they were able to do this in spite of the presence of two or more competitors within the same area implies that there is also growing demand for these services. The demand is apparently being met by DME suppliers and P&O facilities getting into the field in greater numbers than the other types of providers. No doubt the development of new products and techniques for delivering services which are compatible with the types of service delivery that DME suppliers and P&O facilities have traditionally provided have fostered the increased involvement of these types of providers in the seating field.

Staffing Characteristics

Staffing was divided into three categories: management, clinical/professional, and technicians. Those surveyed were asked to allocate their staff within these groupings. Thirteen of the 17 respondents supplied these groupings and 13 of the 17 respondents also supplied salary ranges for their staff positions. Nine of the respondents listed a management position, 13 listed a clinical/professional position, and 11 listed technical positions as existing in their facilities. Seven of the respondents supplied salary ranges for their managers, 13 provided salary ranges for the professionals, and 7 provided salary ranges for the technicians.

Salaries

From the small sample, management salaries are generally in the range of $30,000 to $50,000 per year for all of the types of providers. Within the DME and P&O categories, those identified as managers earned 25-50% more per year than those in the clinical/professional positions. The RECs showed a much smaller differential between salaries, with the managers earning only approximately 7% more per year than the professional staff. Only two of the four RECs provided salary data or listed management; therefore, the 7% salary differential should be viewed with some caution.

The range of salaries within the professional category was generally within $18,000 to $48,000 per year. The professionals earned 20-40% more per year than those identified as technicians. Again, the RECs were at variance with the other providers and showed that, in at least some situations, the professionals earn as much as 76% more than the technicians. The technician salaries were typically in the range of $15,000 to $30,000 per year for all providers. The variance between salaries paid by the RECs in the various classifications and those paid by other providers is possibly explainable by differences in the staff responsibilities and the expertise required of the REC technicians. The clinical staff in the RECs tend to perform a much higher percentage of the fabrication tasks and probably do not require as highly skilled technicians as the other providers seek. The top range for the REC technicians averages about $23,000 per year versus the $30,000 for the other providers, which may also support the contention that the REC technical positions do not require the same level of skills.

Staff Mix

The staff mix, in terms of the ratio of management to professionals and the ratio of professionals to technicians, varies widely among the individual facilities within all of the classifications. When a seating program is young there is typically a lot of crossover in duties and responsibilities among the various employee classifications which does not begin to differentiate itself until the program matures and a larger staff is supported by the program. Generally, within the DME, P&O and hospital-based providers, the ratio of managers to professionals varies from 1:2 to 1:4. The ratio of professionals to technicians is 1:1 to 2:1.

The RECs reported very little management time in the surveys. Typically, the ratio of management to professionals varies between 1:5 and 1:14. There is also a very high professional-to-technician ratio which varies between seven professionals and no technicians to four professionals and one technician.

Time Allocation

The P&O facilities tend to be the most rigidly structured in how their duties are allocated between the managers, the professionals, and the technicians. The managers allocate their time between supervision and marketing, with some client services reported by some of the facilities. The professionals perform almost exclusively client services and marketing while the technicians are almost entirely responsible for fabrication. The DME suppliers are similarly organized, although some of the DME suppliers report that their technicians spend one-third of their time in client services. Both the DME suppliers and the P&O facilities allocate between 5% and 20% of their managers' and professionals' time for marketing.

The RECs report a much looser allocation of time between the management, clinical, and technical staff. The managers' time is allocated almost equally between supervision, client services, and fabrication with approximately 5% set aside for marketing. Professional staff time is divided almost equally between client services and fabrication with approximately 50% to 60% of the time allocated for client services and an additional 5% of the time allocated for marketing. The technical staff spends approximately 95% of its time in technical fabrication with some occasional client services.

One significant difference between the RECs' time allocation and that reported by the DME suppliers and P&O facilities is the relatively small percentage of time set aside for marketing efforts. The RECs are spending only one-half to one-fourth of the time on marketing compared to the other providers. This may also partially explain the large difference in the ratio of new clients to repeat clients reported by the DME and P&O facilities versus the more established RECs.

Benefits

All of the facilities offered paid vacations as a benefit. Vacation time ranged from one to three weeks with two weeks being typical. Holidays ranged between 5 and 12 days per year with most facilities reporting 7 to 10 days as typical. The DME suppliers offered the fewest holidays per year (typically 6 days) which probably is due to the traditional nature of the businesses to remain open as often as possible for the convenience of their large and diverse client market.

Number Who Offered Benefits

	DME	P&O	REC	Hospitals
Number of Responses	6	6	4	2
Paid Vacation	6	6	4	2
Paid Holidays	6	6	4	2
Group Medical	6	6	4	2
Continuing Education	4	4	4	2
Life Insurance	4	3	3	2
Retirement Plan	1	5	4	2
Disability Insurance	1	3	4	0

The DME suppliers are also notably different from the other providers relative to retirement plans and disability insurance. It could not be determined from the questionnaire whether this was a business decision or merely reflected different needs and concerns of the staff. There is possibly a greater turnover in staff among the DME suppliers and they would be less likely to remain with the company long enough to take advantage of a retirement plan. These are usually sales positions, and staff movement among companies, or in and out of the rehabilitation field entirely, may be more common than in the other service delivery models where the individuals have typically invested significant time and money in their professional training. This may also explain the lower emphasis on disability insurance since those individuals whose livelihood depends on being able to exercise their specific professional training (orthotics, engineering, therapy, etc.) may be more sensitive to the benefits of disability insurance. It may also be that these benefits are routinely offered by the larger university and hospital institutions and have little specific meaning to the seating service delivery staff or program. In the case of the relatively smaller P&O facilities, these benefits may have a specific purpose since loss of livelihood is a real concern to the professional orthotists and prosthetists. In addition, a retirement plan may encourage these highly skilled individuals to remain with and help to build the P&O facilities' business.

Summary

This survey demonstrates that rehabilitation technology services can be provided at a profit under a number of the different models identified in Chapter Three. The providers generally chose products and services that were consistent with their model and their previous services and experiences. There can be little doubt that this is a critical factor in the cost-effective delivery of rehabilitation technology services since it was shown previously that labor inefficiencies could quickly eliminate any profit in the provision of these services. Although it could not be determined whether the number of clients with severe disabilities and extremely complex needs were the same for all of the providers, it is very likely that this is not the case. Clients with complex needs often require a trial-and-error approach to their seating problems or require a number of minor adjustments to their seating systems before they are satisfied with the results. This requires a significantly higher investment of staff time and labor expense in order to meet their needs. The admonition in earlier chapters that the percentage these clients represent of the facility's total business must be limited if the facility is to show an overall profit cannot be overstated, since it has been seen in this study that the labor associated with delivering services is a critical factor in the profitability of the service. It has also been seen in this study

that documenting the labor expenses associated with delivering services is important for effective management of the services, for accurately pricing the services, and for justifying to third-party payers the cost of the services.

It appears that the most successful providers were careful to organize their staffs so that those with the greatest skill and experience were not required to squander their time on tasks that could be performed by others with less skill and experience at lower salaries. Some caution should be exercised, however, in accepting this as an absolute rule.

The RECs reported that they were breaking even financially in spite of having a much higher percentage of their professional clinical staff performing technical fabrication duties than did the DME suppliers and the P&O facilities. The RECs generally had very few technicians relative to the other service providers. It appears that the clinical staff performs the technical fabrication duties more efficiently than a less-skilled technician might. This may also be understated when considering only the financial performance, since it is known that at least two of the RECs see a significantly higher percentage of clients with complex needs than do the other types of providers in their immediate area. There is not sufficient information in this study to determine whether or not the RECs would in fact be more profitable or less so if they were to augment their clinical staff with more technicians, without also changing the mix of their clients and the types of services provided.

This study has also shown that marketing efforts are reflected in increased referrals of new clients to the facility. Those facilities who reported a higher percentage of their staff time allocated to marketing also reported a significantly higher rate of new referrals to repeat clients. It is not clear whether those providers who reported the lowest percentage of marketing had reduced their marketing efforts in response to having already captured a sufficient number of referrals in their area, or whether they had never performed a significant amount of marketing. Those with the lowest level of marketing were generally the older and more established seating providers, whereas those who reported the highest levels of marketing were generally newer providers. Nevertheless, marketing is an essential aspect of each of the provider's business and, especially in the first few years of providing services, higher levels of marketing reward the provider with a higher percentage of new referrals.

Most of the respondents in this study appear to have effectively applied many of the principles stated in the previous chapters to their own environments and circumstances relative to seating service delivery. They have generally expanded into the seating field by adopting products and techniques with which they were already familiar or which fit into their previous service delivery system. They, either formally or informally, monitor their expenses and resources and have made adjustments during the first few years in order to create a profitable service. Finally, they have recognized the importance and allocated a portion of their time to marketing their services in their area. While the service delivery model itself does not appear to be an important factor in the ultimate success of the business, the key to maximizing one's chance of success appears to be to offer services within a model with which the provider is already familiar.

CHAPTER SEVEN:
RESOURCES

Alexandra Enders

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ACRONYMS

ADC	Assistive Device Center
ADD	Administration on Developmental Disabilities (U.S. Government)
AFDC	Aid to Families with Dependent Children (U.S. Government)
CVA	Cerebrovascular accident
DME	Durable Medical Equipment
EIF	Electronic Industries Foundation
FTE	Full-time equivalent (relates to staff persons)
HCFA	Health Care Financing Administration (U.S. Government)
HME	Home Medical Equipment (same as DME)
IWRP	Individualized Written Rehabilitation Plan
JAN	Job Accommodation Network
MDA	Muscular Dystrophy Association
MSS	Multiple Sclerosis Society
NAMES	National Association of Medical Equipment Suppliers
NARIC	National Rehabilitation Information Center
NIDRR	National Institute on Disability & Rehabilitation Research (U.S. Government)
NIHR	National Institute on Handicapped Research (Now known as NIDRR)
OSERS	Office of Special Education & Rehabilitative Services (U.S. Government)
OT	Occupational Therapist
P&O	Prosthetic and Orthotic
PT	Physical Therapist
REC	Rehabilitation Engineering Center
REMAP	Rehabilitation Engineering Movement Advisory Panels (in Great Britain)
RESNA	Association for the Advancement of Rehabilitation Technology (formerly the Rehabilitation Engineering Society of North America)
RSA	Rehabilitation Services Administration (U.S. Government)
RET	Rehabilitation Engineering Technology
REV	Rehabilitation Engineering Volunteer Network
SCI	Spinal cord injury
SIG	Special Interest Group
SGA	Substantial Gainful Activity
SSDI	Social Security Disability Income
SSI	Supplemental Security Income
UCPA	United Cerebral Palsy Association
VME	Volunteers for Medical Engineering, Inc.
VR	Vocational Rehabilitation

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MARKETING REFERENCES

Phil Mundy (author of Chapter Two) recommends these publications:

"Becoming a Market-Driven Rehabilitation Program: A Case Study," Paul S. Boynton and Patricia A. Fair, Rehabilitation Literature, Vol. 47, Nos. 7-8, pp. 174-178, July-August 1986.

Conducting Needs Assessment: A Portfolio Resource Manual, The National Easter Seals Society, 1984. Avail. from the Program Services Department, National Easter Seals Society, 2023 West Ogden Avenue, Chicago, IL 60612 (312) 243-8400; 47 pp., approximately $15, specify document No. PF 47.

"Contrasting Private and Public Sector Marketing," Christopher H. Lovelock and Charles B. Weinberg, in American Marketing Association Combined Proceedings, Series 36, Ronald C.Curhan, editor, pp. 242-247, 1974. AMA, Information Center, 250 South Wacker Drive, Suite 200, Chicago, IL 60606 (312) 648-0536.

The Market for Special Seating Aids in Ontario, The Canadian Industrial Innovation Centre, 1982. Avail. from Canadian Posture And Seating Centre, Box 8158, 15 Howard Pl., Kitchener, Ontario, N2K 2B6, Canada (519) 743-8224; approx. 150 pp.

"Marketing Rehabilitation Engineering," Samuel R. McFarland and Lawrence A. Scadden, SOMA Magazine, Vol. 1, No. 2, pp. 19-23, July 1986.

Principles of Marketing, Philip Kotler and Gordon H.G. McDougall, Prentice-Hall Canada Inc., 1st edition, 1983 (out of print). (Available: Principles of Marketing, Philip Kotler, Prentice-Hall Canada, 3rd edition, 1986, approximately $40, specify document #701-730, from Prentice-Hall, New York, [800] 223-1360.)

Putting the One Minute Manager to Work: How to Turn the Three Secrets into Skills, Kenneth Blanchard and Robert Lorber, William Morrow & Co., Inc., New York, 1984. 112 pp. Available for approximately $15 from William Morrow & Co., Inc., 105 Madison Avenue, New York, NY 10016 (800) 631-1199.

Successful Marketing for Small Business, William A. Cohen and Marshall E. Reddick, 1981. Available in bound xerox copy, 288 pages. $72 (catalog #202 3077) from: Books on Demand, Division of University Microfilms, International, 300 N. Zeeb Road, Ann Arbor, MI 48106 (800) 521-0600.

These marketing publications are also recommended:

Materials written by Philip Kottler are highly recommended.

Guerrilla Marketing: Secrets for Making Big Profits from Your Small Business, Jay Conrad Levinson, 1984, 226 pp., $8.95. Houghton Mifflin.

Marketing Without Advertising: Creative Strategies for Small Business Success, Michael Phillips, Salli Rasberry, 1986, $14, Nolo Press, 950 Parker, Berkeley, CA (415) 549-1976.

Rehabilitation in the Public Mind: Strategies of Marketing, Report on the 7th Mary Switzer Memorial Seminar, Leonard Perlman, ed., 1983, 88 pp. Available from National Rehabilitation Assoc., 633 S. Washington Street, Alexandria, VA 22314.

BUSINESS PRACTICE REFERENCES

There is certainly no shortage of business "how-to" books these days. You'll find titles like: Successful Small Business Management, or How to Read a Financial Report, at any good bookstore. The health care trade press is selling any number of titles like: Management Principles for Health Professionals, or Achieving Excellence: A Prescription for Health Care Managers. There are similar management books for engineers and for other fields closely related to rehabilitation technology service delivery. In addition, there are many business oriented magazines, such as:

Harvard Business Review, P.O. Box 866, Farmingdale, NY 11737. This bimonthly magazine comes highly recommended. Subscribe, or you can pick it up at a good newsstand, and go to the library for back issues. Dave Molinari, Training Director at the WV R&T Center, recommends a piece on relationship management, titled "After the sale is over..." (HBR, May-June, 1983).

John Leslie (author of Chapter Four) has these recommendations:

The following references are general in nature and can be utilized by individuals seeking to establish a rehabilitation technology organization. They are listed in no particular order of significance and come highly recommended by persons with knowledge in the field of entrepreneurship. They include:

1. Human Resource Management, Robert L. Mathes and John H. Jackson, 4th edition, West Publishing Co., 1985. Available in revised 5th edition, Fall 1987, for $39.75 from West Publishing Company, 50 W. Kellogg Blvd., P.O. Box 64526, St.Paul, MN 55164 (800) 328-9352.

2. Management and Organization, J. Clifton Williams, Andrew J. Du Brin & Henry L. Sisk, 5th edition, South-Western Publishing Company, 1985. Available for approximately $22 from South-Western Publishing Company, 5101 Madison Road, Cincinnati, OH 45227 (800) 543-0487.

3. The Bank of America publishes several excellent documents relative to small business under the aegis of their Small Business Reporter Program. The publications are typically 20-25 pages long with the last page devoted to sources of further information. These documents include:

   a. "Financing Small Business" (SBR-104).
   b. "Understanding Financial Statements" (SBR-109).
   c. "Steps to Starting a Business" (SBR-110).
   d. "Cash Flow/Cash Management" (SBR-112).
   e. "Personnel Guidelines" (SBR-115).
   f. "Avoiding Management Pitfalls" (SBR-121).
   g. "Financial Records for Small Business" (SBR-128).

The documents can be ordered for $3.00 each, from: Bank of America, Small Business Reporter, Department 3120, P.O. Box 3700, San Francisco, CA 94137.

4. "How to Prepare and Present a Business Plan," Joseph R. Mancuso, 1983, $9.95, 316 pp, Prentice Hall, Inc.

Mr. Mancuso is associated with the Center for Entrepreneur Management, Inc. This organization publishes many excellent documents which can be interpreted by the layman and represent such areas as: business plan preparation, entrepreneurship, starting up, raising capital, marketing, management, and personnel. Requests for information should be sent to the Center for Entrepreneur Management, Inc., 83 Spring Street, New York, NY 10012.

The Essential Whole Earth Catalog recommends:

The Small Business Sourcebook, 1986, 1000 pp., $150.00, postpaid from Gale Research Co., Book Tower, Detroit, MI 48226. "I know of no other single source with so much small business information. Check your library."

Resources Available from Professional Organizations

Many organizations representing professionals (therapists, engineers, counselors, etc.) prepare information for their members on administrative/management/business-related topics, or they may be able to refer you to resource information. You are encouraged to become aware of the resources available within your own group and other professional groups that may have members operating programs in similar environments. Some examples of the types of resources to look for include:

The Occupational Therapy Manager, Jeanette Bair and Madeline Gray, eds., 1985, 420 pp., $30 (AOTA members), $37.50 (nonmembers). AOTA Products, P.O. Box 1725, Rockville, MD 20850.

In this practical guide, some of the field's leading management professionals share their insights on timely topics such as planning an OT department, obtaining payment for services, planning a budget, managing personnel, marketing an OT program. There is also an interesting chapter on the evolution of the American Health Care System.

The AOTA also has an 83 page Information Packet on Private Practice available from its Practice Division.

Prospering in Private Practice: A Handbook for Speech-Language Pathology and Audiology, Katharine Butler, ed. 1986, 304 pp., $33.00, Aspen Publishers, Box 990, Frederick, MD 21701.

Although targeted to speech-language pathologists and audiologists, this book could be useful to any rehabilitation technology service delivery practitioner contemplating going into private practice. Based on the experiences of 25 respected clinicians, it focuses on the business aspects of private practice - from getting a bank loan to marketing your services, from managing cash flow to setting fees, and legal as well as practical advice on liability, legal, and ethical issues.

Resources Available from Trade Associations

There are several organizations that operate as trade associations for programs related to rehabilitation technology service delivery. The larger of these include:

National Association of Medical Equipment Suppliers (NAMES), 625 Slaters Lane, Suite 200 Alexandria, VA 22314 (703) 836-6263

NAMES is a trade association representing more than 2,000 home health care equipment suppliers, more than 30 affiliated state associations, and over 100 home health equipment manufacturers. This is the organization most DME/HME suppliers belong to. A small but growing percentage of its members are in the rehabilitation technology service delivery business, usually with an orientation toward seating services. NAMES offers its members training through its HELP (Health Education Leadership) College. NAMES has an active government relations program. They also offer members several comprehensive insurance packages, including a Liability/Property and Casualty package. The organization produces several publications, including a recent Sales Compensation Survey Report, available only to members.

The National Association of Rehabilitation Facilities (NARF), P.O. Box 17675 Washington, DC 20041 (703) 556-8848

NARF is the largest national organization representing the interests of institutions serving the needs of disabled people. Its members include vocational/developmental facilities, medical facilities, and comprehensive facilities. Publishes documents for rehabilitation service administrators, including material relative to proper practices for operating a rehabilitation business/facility, for example:

Selected Aspects of Financial Management in Rehabilitation Facilities: A Resource Manual, Lorenz, Graham, Hashey, & Baker, 1981, 128 pp., $21.50. Order from: Materials Development Center, Stout Vocational Rehabilitation Institute, UW-Stout, Menomonee, WI 54751. Call (715) 232-1342 for specific information.

American Orthotic & Prosthetics Association (AOPA), 717 Pendleton Street Alexandria, VA 22314 (703) 836-7116

The American Orthotic & Prosthetics Association (AOPA) produces resource materials for its members. These include an accounting manual, business surveys, patient management records and related forms, a Medicare manual, a durable medical equipment study, HCFA common procedure coding system manual, and a pictorial reference manual for P&O.

You can order these materials at nonmember rates, but it may be more efficient to establish a relationship with a local P&O company, and borrow its documents, unless, of course, you are planning to compete with its seating service (if it has one).

AOPA conducted a week-long business practices conference in June 1987, "Today's Leaders Meeting Tomorrow's Challenges." A comprehensive report will be available in late 1987, describing strategies developed by 68 leaders in the field for addressing issues in private practice P&O. It is likely that some of these issues will be similar to other practitioners in the field of rehabilitation technology service delivery.

Changing to For-Profit Status

If you are considering converting your nonprofit organization to for-profit status, or starting up a for-profit subsidiary:

Alpha Center for Public/Private Initiatives, Inc.
Suite 955, Southgate Office Plaza
5001 West 80th Street
Minneapolis, MN 55437
(612) 831-5506

The Alpha Center is a national nonprofit organization created by a group of corporations and individuals to assist human service entrepreneurs and their emerging industry. The center's programs are divided into three areas: information services, management assistance, and financing.

FUNDING FOR REHABILITATION TECHNOLOGY SERVICES AND PROGRAMS: GRANTS AND R&D CONTRACTS

This document has emphasized a business-oriented approach to rehabilitation technology service delivery. Much of the information relevant to the fiscal operations of a business can be gleaned from standard business procedures. Some models of rehabilitation technology service delivery however, though they may be based on sound business practices, still rely heavily on "soft money," e.g., grants. There are many sources of information on how to successfully seek grant funds.

If you are new at the grantmanship game, start with:

The Foundation Center
79 Fifth Avenue
New York, NY 10003
(212) 620-4230
(800) 424-9836

The Foundation Center is a national service organization founded and supported by foundations to provide a single authoritative source of information on foundation giving. The Center's programs assist in matching foundation interests with nonprofit needs by 1) publishing reference books on foundations and foundation grants and 2) disseminating information on foundations through a nationwide public information and education program.

All private foundations actively engaged in grantgiving, regardless of size or geographic location, are included in one or more of the Center's publications. There are basically three kinds: 1) directories and databases that describe specific foundations, characterizing their program interests and providing fiscal and personnel data; 2) guides and related materials which introduce the reader to funding research, and elements of proposal writing, and 3) other topics of interest to non-profit organizations.

The Center disseminates information on foundations through a nationwide public information and education program offered through its two national libraries in New York City and Washington, DC, two regional libraries, and its national network of 170 cooperating library collections. Each library provide free public access to all of the Center's publications, plus a wide range of other books, services, periodicals, and research documents relating to foundations and philanthropy. Most also offer professional assistance for visitors as well as a variety of special services, including orientations and workshops, audiovisual instruction, directories of local funding possibilities, and bibliographies and research on related topics.

For the name of the library collection nearest you or for more information about the Center's program, call (800) 424-9836.

The Grantsmanship Center
1031 South Grand Avenue
Los Angeles, CA 90015
213/749-4721

If you are going to get into the grant-writing game, get on the Center's mailing list. They publish the Grantsmanship Center News, an extremely informative bimonthly magazine. They run seminars nationally, and have a wide range of excellent resource materials available, including: "Program Planning & Proposal Writing," "Special Events Fundraising," "Marketing Nonprofits," and "Exploring Corporate Giving."

The Small Business Innovation Research Program

Federal R&D money is not just for nonprofit organizations. Certain categories of grants are available to for-profit companies too, and some sources, for example, the Small Business Innovation Research (SBIR) Program, is only available to for profit firms.

"In the belief that small firms could produce more innovative research to meet federal agency needs, the Congress enacted Public Law 97-219, the Small Business Innovation Development Act of 1982. The SBIR program is intended to fund R&D work in small, high technology companies by designating that a fixed percentage of a federal agency's annual extramural (external) R&D budget be awarded to small businesses. The act requires that each federal agency with an R&D budget of $100 million or more establish and operate an SBIR program. Under SBIR program requirements, such agencies must designate that at least 1.25 percent of their external research expenditures for R&D projects be carried out by small businesses.

"Federal agencies with SBIR programs solicit proposed research projects from small businesses to address agencies' R&D needs. Once proposals are submitted, agencies evaluate and fund them in a three-phase process. Phase I awards are given to deserving proposals to demonstrate the scientific and technical feasibility of the idea contained in the proposal. These awards are usually for $50,000 or less and cover a 6-month work period. On the basis of the phase I results, phase I awardees can compete for a phase II award, and agencies make phase II awards to those projects judged to be the best of the phase I awardees. Phase II work is to further develop the phase I research; awards are made for $500,000 or less and usually cover 1 to 2 years of work. Phase III awards involve either nonfederal funding or federal, non-SBIR funding for commercial applications of the research conducted under the SBIR program.

"SBIR program funds are designated for individuals and/or small businesses that at the time of award:

- are independently owned and operated,
- are smaller than the dominant firms in the field in which they are proposing to carry out SBIR projects,
- are organized and operated for profit,
- have 500 or fewer employees (including employees of subsidiaries and affiliates),
- are the primary source of employment for the project's principal investigator at the time of award and during the period when the research is conducted, and
- are at least 51 percent owned by U.S. citizens or lawfully admitted permanent resident aliens.

"Through the SBIR program, entrepreneurs and small companies can obtain initial funding to develop and launch innovative ideas. In our opinion, the program offers a low-risk opportunity for most small firms, since the government finances the principal R&D effort and bears the risk of failure in the research."

Excerpted from:
GAO Briefing Report to Congressional Requesters: Federal Research, Small Business Innovation Research Participants Give Program High Marks, July, 1987, 55 pp. Document #GAO/RCED-87-161BR. Available from General Accounting Office, Information Handling and Support Facility, Document Handling and Information Service Component, Box 6015, Gaithersburg, MD 20877 (202)275-6241.

GOVERNMENT AGENCIES WITH INTERESTS IN REHABILITATION TECHNOLOGY

These are some of the major agencies involved. A comprehensive list is beyond the space limitations of this guide. If you are interested in information or in applying for federal grants or contracts, and don't know where else to start, get a copy of the Directory of National Information Sources on Handicapping Conditions and Related Services listed here.

Department of Education
Office of Special Education and Rehabilitative Services (OSERS)
(National Institute of Disability and Rehabilitation Research)
(Rehabilitation Services Administration)
(Special Education Programs)
Mary Switzer Building
330 C Street, SW
Washington, DC 20202

Department of Health and Human Services
(Administration on Developmental Disabilities)
(Administration on Aging)
(Crippled Children's Service)
200 Independence Ave., SW
Washington, DC 20201

NASA
Federal Building #10B
600 Independence Ave., SW
Washington, DC 20546

National Institute of Health
9000 Rockville Pike
Bethesda, MD 20892

Veteran's Administration
810 Vermont Ave., NW
Washington, DC 20420

Many states support rehabilitation technology service delivery programs. You are encouraged to determine what may be available in your state, and to use this document, Planning and Implementing Augmentative Communication Service Delivery, and Rehabilitation Technologies (listed elsewhere in this chapter) to help discover exemplary models of service delivery operating in other areas of the country, which may be transferable to your locale.

NATIONAL ORGANIZATIONS WITH AN INTEREST IN TECHNOLOGY AND DISABILITY

For annotated information on disability-related groups, organizations and agencies, you are encouraged to obtain a copy of the Directory of National Information Sources on Handicapping Conditions and Related Services, produced by the National Institute on Disability and Rehabilitation Research, June 1986, 366 pp, $17.00. Available from: Government Printing Office, Public Documents Dept., Washington, DC 20402-9325. Orders must be prepaid, check payable to: Superintendent of Documents; can be ordered by phone with Mastercard or Visa (202) 783-3238.

The Coalition on Technology and Disability

This group has been meeting regularly in Washington, DC since December 1986. The following groups are on the coalition's mailing list. They are national in scope, but may also have local or regional chapters; in some cases a Washington, DC, address is given, although the group's main headquarters is elsewhere (usually New York or Chicago; the exact address can be found in the above directory). Some of these groups are very large, and have diverse interests; it may take a while to locate the individual who is responsible or interested in rehabilitation technology.

American Academy of Physical Medicine and Rehabilitation
122 S. Michigan Street, Suite 300
Chicago, IL 60603
(312) 922-9366

American Association for the Advancement of Science
1333 H Street NW
Washington, DC 20005
(202) 326-6672 (voice or TDD)

American Association of Retired Persons
1909 K Street NW
Washington, DC 20049
(202) 728-4370

American Association of University Affiliated Programs
8605 Cameron Street, Suite 406
Silver Spring, MD 20910
(301) 588-8252

American Congress of Rehabilitation Medicine
130 S. Michigan Avenue, Suite 1310
Chicago, IL 60603-6110
(312) 922-9368

American Council of the Blind
1010 Vermont Avenue NW, Suite 1100
Washington, DC 20005
(202) 393-3666

American Foundation for the Blind
15 West 16th Street
New York, NY 10011
(212) 620-2080

American Hospital Association
840 North Lake Shore Drive
Chicago, IL 60611
(312) 280-6132

American Institute of Architects
1735 New York Avenue NW
Washington, DC
(202) 626-7300

American Occupational Therapy Association
Box 1725
1383 Piccard Drive
Rockville, MD 20850
(301) 948-9626

American Orthotic and Prosthetic Association
717 Pendleton Street
Alexandria, VA 22314
(703) 836-7116

American Physical Therapy Association
1111 North Fairfax Street
Alexandria, VA 22314
(703) 684-2782

American Society of Allied Health Professionals
1101 Connecticut Avenue NW, Suite 700
Washington, DC 20036
(202) 857-1150

American Society for Engineering Education
11 Dupont Circle, Suite 200
Washington, DC 20036
(202) 293-7080

American Society for Hospital Engineering
840 North Lake Shore Drive
Chicago, IL 60611
(312) 621-6712, x6379

American Society of Mechanical Engineers
1825 K Street NW
Washington, DC 20006-1202
(202) 785-3756

American Speech-Language-Hearing Association
10801 Rockville Pike
Rockville, MD 20852
(301) 897-5700

Amyotrophic Lateral Sclerosis (ALS) Association
15300 Ventura Boulevard, Suite 315
Sherman Oaks, CA 91403
(213) 990-2151

Association for the Advancement of Medical Instrumentation
1901 N. Fort Myer Drive, Suite 602
Arlington, VA 22209
(703) 535-4890

Association for Education and Rehabilitation of Blind and Visually Impaired
206 N. Washington Street
Alexandria, VA 22314
(703) 548-1884

Association of Medical Rehabilitation Directors
87 Elm Street
Framingham, MA 01701
(617) 877-0517

Association for Retarded Citizens
1522 K Street NW, Suite 516
Washington, DC 20005
(202) 785-3388

Auditory Verbal International
1300 Ruppert Road
Silver Spring, MD 20903
(301) 593-1636

Blinded Veterans Association
1726 M Street NW, Suite 800
Washington, DC 20036
(202) 223-3066

Congress of Organizations of the Physically Handicapped
16630 Beverly Avenue
Tinley Park, IL 60477
(312) 532-3566

Council on Exceptional Children
1920 Association Drive
Reston, VA 22091
(703) 620-33660

Council of State Administrators of Vocational Rehabilitation
1055 Thomas Jefferson Street NW
Suite 401
Washington, DC 20007
(202) 638-4634

Cystic Fibrosis Foundation
6931 Arlington Road
Bethesda, MD 20814
(301) 951/4422
(800) FIGHT CF [(800) 344-4823]

Disabled American Veterans
807 Maine Avenue, SW
Washington, DC 20024
(202) 554-3501

Dole Foundation
1819 H Street NW, Suite 850
Washington, DC 20006
(202) 457-0318

Epilepsy Foundation of America
4351 Garden City Drive
Landover, MD
(301) 459-3700

Goodwill Industries of America
9200 Wisconsin Avenue
Bethesda, MD 20814
(301) 530-6500

Health Industry Distributors Association
1701 Pennsylvania Avenue NW
Washington, DC
(202) 659-0050

Health Industry Manufacturers Association
1030 15th Street NW
Washington, DC 20005
(202) 452-8240

Human Factors Society
Technical Group on Aging
Committee on Rehabilitation
10765 SW 104th Street
Miami, FL 33176
(305) 271-0012

I-NABIR
12100 Portree Drive
Rockville, MD 20852

Institute of Electrical and Electronic Engineers
1111 19th Street NW, Suite 608
Washington, DC 20036
(202) 785-0017

Institute for Rehabilitation and Disability Management
102 Irving Street
Washington, DC 20010
(202) 877-1196

ISAAC
P.O. BOx 1762, Station R
Toronto, Ontario M4G 4A3
Canada

Kennedy Foundation
1350 New York Avenue NW, Suite 500
Washington, DC 20005

Lekotek
2100 Ridge
Evanston, IL 60204
(312) 328-0001

Mainstream
1200 15th Street NW, Suite 1010
Washington, DC 20005
(202) 887-0136

Muscular Dystrophy Association
810 Seventh Avenue
New York, NY 10019
(212) 586-0808

National Association of Children's Hospitals
401 Wythe Street
Alexandria, VA 22314
(703) 684-1355

National Association of the Deaf
814 Thayer Avenue
Silver Spring, MD 20910
(301) 587-1788 (voice or TDD)

National Association of Home Builders
National Research Center
400 Prince Georges Center Boulevard
Upper Marlborough, MD 20772
(301) 249-4000

National Association of Medical Equipment Suppliers
625 Slaters Lane, Suite 200
Alexandria, VA 22314
(703) 836-6263

National Association of Protection and Advocacy Systems
300 Eye Street NE, Suite 212
Washington, DC 20002
(202) 546-8202

National Association of Rehabilitation Facilities
P.O. Box 17675
Washington, DC 20041
(703) 556-8848

National Association of Rehabilitation Professionals in Private Sector
P.O. Box 708
Twin Peaks, CA 92391
(714) 337-0746

National Association of State Directors of Special Education
2021 K Street NW, Suite 315
Washington, DC 20006
(202) 822-7933

National Center for Appropriate Technology
815 15th Street NW, Suite 938
Washington, DC 20005
(202) 347-9193

National Council on the Aging
600 Maryland Avenue SW
Washington, DC 20024
(202) 479-1200

National Council on the Handicapped
800 Independence Avenue SW, Suite 814
Washington, DC
(202) 267-3846

National Council on Independent Living
815 West Van Buren, Suite 525
Chicago, IL 60607
(312) 226-5900
(312) 226-1687 (TTY/TDD)

National Easter Seal Society
1350 New York Avenue NW, Suite 415
Washington, DC 20005
(202) 347-3066

National Education Association
1201 16th Street NW, Room 614
Washington, DC 20036
(202) 822-7300

National Federation of the Blind
1800 Johnston Street
Baltimore, MD 21230

National Handicapped Sports and Recreation Association
1145 19th Street NW, #717
Washington, DC 20036
(202) 877-1932

National Head Injury Foundation
2118 Golf Course Drive
Reston, VA 22180
(703) 560-6800

National Organization on Disability
910 16th Street NW
Washington, DC
(202) 293-5960

National Recreation and Park Association
3101 Park Center Drive
Alexandria, VA 22302
(703) 820-4940

National Rehabilitation Association
633 S. Washington Street
Alexandria, VA 22314
(703) 836-0850

National Rehabilitation Counseling Association
633 S. Washington Street
Alexandria, VA 22314
(703) 836-0850

National Society of Professional Engineers
1420 King Street
Alexandria, VA 22314
(703) 684-2800

National Spinal Cord Injury Association
149 California Street
Newton, MA 02158
(800) 638-1733

Older Americans Consumer Cooperative
1334 G Street NW, Suite 500
Washington, DC 20005
(202) 393-6222

Organization for the Use of the Telephone
Box 175
Owings Mills, MD 21117-0175
(301) 655-1827

Paralyzed Veterans of America
801 18th Street NW
Washington, DC 20006
(202) 872-1300

President's Committee on Employment of the Handicapped
1111 20th Street NW, Room 600
Washington, DC 20036
(202) 653-2088

Recording for the Blind
1400 20th Street NW
Washington, DC 20036

Rehabilitation Technology Association
c/o West Virginia R&D Center
One Dunbar Plaza, Suite E
Dunbar, WV 25303
(304) 348-6340

RESNA, Association for the Advancement of Rehabilitation Technology
1101 Connecticut Avenue NW, Suite 700
Washington, DC 20036
(202) 857-1199

Self Help for Hard of Hearing People
7800 Wisconsin Avenue
Bethesda, MD 20814-3524
(301) 657-2248 (voice and TTY)

Spina Bifida Association of America
P.O. Box 3222
Washington, DC 20007

TASH - The Association of Persons with Severe Handicaps
1522 K Street NW, Suite 112
Washington, DC 20005
(202) 683-5586

United Cerebral Palsy Association
1522 K Street NW, Suite 1112
Washington, DC 20005
(202) 842-1266

USA Toy Library Association (USA-TLA)
104 Wilmot Road, Suite 201
Dearfield, IL 60115
(312) 940-8800

STATISTICAL INFORMATION RESOURCES

Whether you need demographic statistics for activities such as program planning, or for documentation of needs and impact statements in research and funding proposals, the references can be hard to find. Here are some sources of data.

Statistics About Disabled People

Data on Disability from the National Health Interview Survey, 1983-85. Scheduled for release in Spring, 1988. Available from: Inez Fitzgerald, Department of Education, OSERS-NIDRR, Room 3424, Switzer Building, 330 "C" Street SW, Washington, DC 20201. No charge, if you send a mailing label with your mailing address filled in.

U.S. Bureau of the Census, Current Population Reports, Series P-70, No. 8, Disability, Functional Limitation, and Health Insurance Coverage: 1984/85, 1986. $2.75. No longer available from: Superintendent of Documents, Government Printing Office, Washington, DC 20402. Stock #703 088/00007/4. Try the Bureau of Census, Room 1628-3, Washington, DC 20233 (202) 763-4100. Make check payable to Superintendent of Documents.

Labor Force Status and Other Characteristics of Persons with a Work Disability: 1982. U.S. Bureau of the Census, Current Population Reports, Series P-23, No. 127, US Government Printing Office. $4.50. 1983.

Guide to Information on Disability Statistics

Compilation of Statistical Sources on Adult Disability. 1986. Prepared under contract to the National Institute on Disability and Rehabilitation Research, U.S. Department of Education. Available from: Inez Fitzgerald, Department of Education, OSERS-NIDRR, Room 3424, Switzer Building, 330 "C" Street SW, Washington, DC 20201. No charge, if you send a mailing label with your mailing address filled in.

Summary of Data on Handicapped Children and Youth. 1985. Prepared under contract to the National Institute on Disability and Rehabilitation Research, U.S. Department of Education. Available from: Inez Fitzgerald, Department of Education, OSERS-NIDRR, Room 3424, Switzer Building, 330 "C" Street SW, Washington, DC 20201. Supplies are limited: there is no charge, if you send a mailing label with your mailing address filled in. It may also still be available from the Government Printing Office for $6.00 (#065000002477).

INFORMATION RESOURCES

A comprehensive listing of information centers, clearinghouses, public and private databases, bulletin boards, and other information resources relevant to rehabilitation technology service delivery can be obtained from:

Marian Hall
Adaptive Equipment Center
Newington Children's Hospital
181 East Cedar
Newington, CT 06111 (203) 667-5405

Some available resources include:

Databases

ABLEDATA
National Rehabilitation Information Center
The Catholic University of America
4407 Eighth Street NE
Washington, DC 20017
(202) 635-6090
(800) 346-2742 (800/34 NARIC)

The most comprehensive of the computerized databases of commercially available products for rehabilitation and independent living. Lists over 15,000 products from 1800+ manufactures; updated monthly.

Accent on Information
P.O. Box 700
Bloomington, IL 61702
(309) 378-2961

A computerized database of product, publication and related resource information. Has about 6,000 entries. Is updated every two years.

CTG Solutions
Closing the Gap
P.O. Box 68
Henderson, MN 56044
(612) 248-3294

Database with information on computer technology for individuals with disabilities. Information on hardware, software, publications, organizations, and practices/procedures.

Technology Resource Centers/Information Services:

JAN (Job Accommodation Network)
West Virginia University
809 Allen Hall
P.O. Box 6122
Morgantown, WV 26506-6122

(304) 293-7186 (general information)
(304) 526-4698 (WV residents)
(800) 526-7234 (800/JAN-PCEH)

An information service related to products, worksite modifications, and other job accommodations. Uses information specialists and a computerized database of solutions to accommodate functional access limitations in work environments.

National Technology Center
American Foundation for the Blind
15 West 16th Street New York, NY 10011
(212) 620-2000

Information service and a computerized database related to products and technology services for blind and visually impaired persons.

Tech-Knowledge
Center of Rehabilitation Technology
Georgia Institute of Technology
Atlanta, GA 30332
(404) 894-4960

Information service related to technology for individuals with disabilities. Uses a computerized database and an information clearinghouse.

Trade Shows, Conferences

Technology-related presentations are being included in more and more conferences, and most professional meetings have some form of product exhibits. Attendance at them is a good way to stay current.

The two major product exhibitions:

Abilities Unlimited. Largest consumer oriented product exhibition. Los Angeles in late April.

The National Home Healthcare Exposition. The largest trade show for suppliers. Held in Atlanta in late November.

Of the many conferences, the RESNA conference in late June, and Closing the Gap, in Minneapolis, in mid-October, are two of your best bets.

RECOMMENDED PUBLICATIONS ON SERVICE DELIVERY MODELS/SYSTEMS

Adaptive Design Service Project: Manual for Replication. Publication #14730-55-100, 1987, 80 pp. This manual was developed by Brian Maurer, Adaptive Design Service, Lakeville Hospital Rehabilitation Center, Lakeville, MA 02346 (617) 947-1231 x652. It was sponsored by the Bureau of Institutional Schools, Division of Special Education, Department of Education, 1385, Quincy, MA 02169. It may be available from both of these sources, and will probably be free. It describes in great detail (floor plans, tool lists, etc) how to develop an adaptive design service.

The Adaptive Design Service is also publishing a folksy little newsletter for people in the field of adaptive design: "Designer Notes."

Assistive Devices for Handicapped Students: A Model and Guide for a Statewide Delivery System. National Association of State Directors of Public Education, 1201 Sixteenth Street, NW, Washington, DC 20036 (202) 844-4193, 27 pp., $4.50, 1980. This publication describes an ideal model for a comprehensive assistive device center that can provide a cost-effective, coordinated delivery system to ensure that handicapped students who need adaptive aids and equipment have access to them and are trained in their most efficient use. The document includes a guide for implementation of the model.

Augmentative Communication: Implementation Strategies. In press. Will be available from: American-Speech-Language-Hearing Association, 10801 Rockville Pike, Rockville, MD 20852 (301) 897-8682. The result of the two-year project "Implementation Strategies for Improving the Use of Communication Aids in Schools Serving Handicapped Children," the book includes chapters on administration of a communication aids program and on staff development. It is based on the successful experiences of the 11 Model Outreach Sites in this project.

Integrating Technology Into Service Delivery. This three-year demonstration project is currently underway. It is charged with designing, implementing, and evaluating a new program model for incorporating rehabilitation technology screening and referral activities into public/private agencies providing services to persons with developmentally disabilities. For more information, contact: Betts Hoover, Project Director Box 19129, GSSW, Arlington, TX 76019 (817) 794-5030.

An Integrated Approach to the Development of a National Rehabilitation Technology Service Delivery System. The purpose of this three-year NIDRR R&D project (10/1/85 - 9/30/88) is to study methods that will facilitate the establishment, growth, and operation of a national network of local and regional rehabilitation engineering/technology service delivery programs, thereby expanding the availability of cost-effective, comprehensive rehabilitation technology services.

Resource materials are being developed, including: Rehabilitation Technology Service Delivery: A Practical Guide, a new edition of Technology for Independent Living Sourcebook, and a directory of current rehabilitation technology service delivery programs. The article, "Planning and Implementing Rehabilitation Technology Services," A. Enders, American Rehabilitation, Jan-Feb-March 1987, is recommended.

For more information, contact: Alexandra Enders, Electronic Industries Foundation, 1901 Pennsylvania Avenue NW, Suite 700, Washington, DC 20006 (202) 955-5827.

Planning, Implementation and Assessment of Students in a Statewide Assistive Device Center. Available from: Pennsylvania Special Education Assistive Device Center, Elizabethtown Hospital and Rehabilitation Center, Elizabethtown, PA 17022 (717) 367-1161.

Planning and Implementing Augmentative Communication Service Delivery. Carolyn Costen, editor. This publication is being distributed as a companion piece to the Guide. It was developed by the Great Lakes Area Regional Resource Center for use at a meeting in Chicago, April 20-22, 1987. The table of contents can be found at the end of this chapter.

Project TEACH: Technical Educational Aids for Children with Handicaps, a Model and Demonstration Project. May be ordered at $5.00 each from the Division of Special Education, Memphis City Schools, 2597 Avery Avenue, Memphis, TN 38112, 1981. Describes a project to direct rehabilitation engineering to the needs of children with severe neuromuscular and communication deficiencies. Aids and devices were designed or adapted to assist in communication, seating, mobility, feeding, and toileting. The program included a technology section, services to children and to parents. Includes case studies, project newsletters, forms, data sheets, and photographs. The project was conducted in cooperation with the University of Tennessee Rehabilitation Engineering Program.

Project Threshold: A Model System for Delivery of Rehabilitation Engineering Services. Annual Reports, 1979, 1980. For more information, contact Nancy Somerville, Project Threshold, 500 HUT, Rancho Los Amigos Hospital, Downey, CA 90242

Rehabilitation Technologies. Thirteenth Institute on Rehabilitation Issues, 1987, $11.00, 122 pp. Available from Research and Training Center, Stout Vocational Rehabilitation Institute, University of Wisconsin-Stout, Menomonee, WI 54751 (715) 232-1380. The document's stated purpose is to provide information concerning resources, strategies, models, and techniques for making rehabilitation technology available to more persons with disabilities. Its main function is to help the rehabilitation practitioner understand and use technology along with other more traditional rehabilitation strategies to enhance the lives of persons with disabilities. Includes chapters on models, policy issues, etc.

Suggested Approach for Establishing a Rehabilitation Engineering Information Service for the State of California. Lo F. Christy, Gail Kelton-Fogg, Ruth Lizak, and Cynthia Vahlkamp. SRI International, Menlo Park, CA. 271 pages, 1978.

Symposium on Rehabilitation Technology Service Delivery: Background Papers. Brief papers describing the operation of each of the 28 exemplary rehabilitation technology service delivery programs invited to participate in the Symposium on Rehabilitation Technology Service Delivery held in Arkansas September 19-23, 1987. Information on availability from: Electronic Industries Foundation, 1901 Pennsylvania Avenue NW, Suite 700, Washington, DC 20006 (202) 955-5810.

PUBLICATIONS RELATED TO REHABILITATION TECHNOLOGY SYSTEMS/PUBLIC POLICY

The Application of Technological Developments to Physically Disabled People. Joseph La Rocca and Jerry S. Turem. Publications Office, Urban Institute, 2100 M Street NW, Washington, DC 20047. 117 pp, $3.50, 1978.

A Conference: Environmental Adaptations: Access to Occupational and Independent Living Opportunities. May 9-12, 1986. Conference report and videotape (VHS, 20 minutes) available from: Cerebral Palsy Research Foundation of Kansas, Inc., Rehabilitation Engineering Center, 2021 N. Old Manor Road, Wichita, KS 67208. Attn: Leah Ross. Videotape is $25.00. Focus of the conference was practical technology utilization. Needs were identified and solutions/recommendation were prioritized, and are reported in this document.

Technology and Aging in America. Office of Technology Assessment, U.S. Congress, Washington, DC. Summary available from OTA, full report available from Government Printing Office, Washington, DC. June 1985, 496 pp. An excellent analysis. However, when policy issues and options recommended here are compared to those in OTA's study of technology and disabled people, some substantial discrepancies appear. Since issues related to aging "drive" many of the public policy areas, especially those related to health care reimbursement, it is important to analyze these two sets of policy recommendations in tandem.

Technology and Handicapped People. U.S. Congress, Office of Technology Assessment (OTA), 1982. Summary available from: OTA, Congress of the U.S., Washington, DC 20510. Full report available from: S/N 052-003-00874, Superintendent of Documents, Government Printing Office, Washington, DC 20402. $7.00. This is an excellent analysis of the entire field of applied technology for disabled people. The OTA is currently preparing a 40-50 page update of this document. It should be available in late 1987, directly from OTA (600 Pennsylvania Avenue SE, Washington, DC 20510).

The Use of Technology in the Care of the Elderly and the Disabled: Tools for Living. Jean Bray and Sheila Wright, editors. 1980, 267 pp., $29.95, Greenwood Press, 88 Post West, Westport, CT 06881. Based on papers at two symposia held in London and Berlin in 1979 under the sponsorship of the Commission of the European Communities; the issues are relevant to the United States.

OTHER RESOURCES

Locating Existing Service Delivery Programs

Survey of Rehabilitation Technology Service Delivery Programs and a Directory of RESNA Members Who Provide Services. Available from RESNA. Lists information on programs in the United States and Canada. Based on information collected in February 1987.

Developing Forms, Guidelines, etc.

Specific examples of data collection forms, record-keeping formats, clinic procedural guidelines, protocols, etc., have not been included in this Guide. However, this type of information is not generally considered to be proprietary and many programs may be willing to share their documents with you. Contact other programs and request samples of their materials, and their permission to "borrow" ideas from them as you go about developing your own forms. It doesn't hurt to ask, and it could save you a lot of time.

Funding Strategies Information

Payment for Assistive Devices and Services Project. The EIF REC is developing training materials that can be used to instruct a variety of different audiences in funding and financing strategies. An annotated bibliography of existing materials will be available December 1987. Training approaches will be tested in 1988.

Some of the most useful funding information available comes from areas in rehabilitation technology service delivery programs that have evolved outside the traditional domains of health care reimbursement: sensory aids, communication devices, etc. The products may be specific to one or another group, but the information in these documents is generic to the field of rehabilitation technology service delivery:

Financing Adaptive Technology: A Guide to Sources and Strategies for Blind and Visually Impaired Users. Steven Mendelson, May,1987, 206 pp. Available from: Smiling Interfaces, P.O. Box 2792, Church Street Station, New York, NY 10008-2792; $20.00; specify format: print, braille, audio cassette, Apple IIe disk.

Although the guide focuses on the service systems and sensory aids which are of particular concern to visually disabled persons, everyone interested in rehabilitation technology should find it useful. The analysis of legislation related to adaptive technology policy is especially valuable, since it takes a lawyer's approach of "if it doesn't say you can't, then you can" rather than the attitude most of the rest of us employ "if it doesn't say I can, then I can't." It encourages creativity in developing successful funding strategies.

The book delineates resources and describes procedures for paying for sensory aids. It explains all the sources of technology funding: the vocational rehabilitation system, other programs of state agencies, the social security system, the tax system, the commercial credit system, government and nonprofit loan programs, veterans benefits, the special education system, and more. The guide explains the relevance

and operation of each of these sources, analyzes issues and problems that arise in using them, suggests relationships among them, and alerts the equipment seeker to the complexities that may occur. The guide aims at formulation of acquisition strategies, many of which are not commonly known to consumers or professionals.

Funding Book: The Many Faces of Funding. Anna Hoffman. Available from Phonic Ear, Inc., 250 Camino Alto, Mill Valley, CA 94941. $25.00. Monthly Newsletter is $5.00/year. Although focused on funding strategies for communication devices, the information is also readily applicable to funding for other types of equipment.

The book, a three-ring looseleaf notebook, is divided into five sections: the Overview provides highlights of sources of funding on the federal, state, educational, insurance and private levels; Method of Procedure informs on how to package funding applications; Case Histories inspires ideas through "how to" stories; Legislation informs on any changes in federal, state or local laws; and the monthly newsletters provide the most current funding information and keep the book current and updated.

Assistive Devices: Funding Sources in Michigan. September 1987, 23 pp. The PAM Assistance Center updates funding information almost annually in its newsletter "PAM REPEATER". There may be groups in your area who collect, if not publish, similar information.
Available from PAM Assistance Center, 601 West Maple Street, Lansing, MI 48906 (517) 371-5897.

Planning and Implementing Augmentative Communication Service Delivery has an excellent chapter on funding.

Training Programs for Rehabilitation Technology Service Providers

University of Virginia

Graduate-level academic program at the University of Virginia, leading to a master's degree in biomedical engineering with an emphasis in rehabilitation engineering. This is one of only two academic program in the United States that will be training engineers in clinical rehabilitation engineering. Contact:

Colin McLaurin
PO Box 7646
Charlottesville, VA 22906
(804) 977-6731

Louisiana Tech University

Rehabilitation Services Administration (RSA) has begun to fund training activities related to rehabilitation technology service delivery under its Rehabilitation Long-Term Training program:

"Training in Rehabilitation Technology" (10/1/87-9/30/90)

The first and third years will train 15 engineer/technologists per session in a three-week intensive course at the LSU campus; in the second year there will be a

workshop in each of the five states in region VI (30 participants per state, focus on counselors and other practitioners); 20 people from the region will also be attending an advanced course at LSU. Contact:

Paul Hale
Center for Rehabilitation Science and Biomedical Engineering
P.O. Box 10426
Ruston, LA 71272
(318) 257-4562

Mississippi State University

"Rehabilitation Engineering/Technology in Action (RE/TINA)" (10/1/87-9/30/90)

Training targeted to regions IV and VI public and private agencies for the blind. A series of one-week training programs will be held at Mississippi State for technology specialists and administrative personnel employed by those agencies. Objectives: to develop understanding of rehabilitation engineering/technology for blind people by administrators, supervisors, and purchasing agents, and to improve delivery of service by agency technology specialists. Contact:

John Maxson
Rehabilitation Research and Training Center on Blindness
Box 6189
Mississippi State, MS 39762

"Sensory Aids Specialist Training Program" (10/1/85-9/30/88)

Contact:

B.J. Maxson
Rehabilitation Research and Training Center on Blindness
Box 6189
Mississippi State, MS 39762

San Francisco State University

"Rehabilitation Engineering Technology Training Project"

Interdepartmental project to train rehabilitation counselors in rehabilitation technology and to train engineers in rehabilitation engineering. Field work at the Rehabilitation Engineering Center, Children's Hospital at Stanford and other community agencies, and project work at the SFSU Engineering Design Center lead to a certificate and/or master's degree. Individual courses may be taken for professional development (9/1/87-8/30/90). Contact:

Alice Nemon, DSW, Counselling Department (415/338-2005) or
Ralf Hotchkiss, Engineering Division (415/338-7734)
San Francisco State University
1600 Holloway
San Francisco, CA 94132

University of Wisconsin-Stout

"Field Based Training of Rehabilitation Professionals in Region V in Rehabilitation Engineering Technology" (10/1/1987 - 9/30/1990)

Emphasis is on vocational rehabilitation field staff, facilities staff, and independent living centers.

"Training of Rehabilitation Technology Specialists" (9/1/86 -9/1/89)

Bachelor's-level academic program for vocational rehabilitation-oriented professionals.

Contact:

Tony Langton, Director
Center for Rehabilitation Technology
University of Wisconsin-Stout
Menomonee, WI 54751
(715) 232-2248

There are other programs around the country that routinely sponsor technology-related training for practitioners:

Storer Center

Contact:

Jeff Moyer
Director of Rehabilitation
Cleveland Society for the Blind
1909 East 101 Street
Cleveland, OH 44106
(216) 791-8118

There are university programs which offer professional training with an emphasis in rehabilitation technology. These are a few of them:

California State University, Sacramento
New York University (occupational therapy)
Sheridan University, Brampton Campus, Ontario, Canada
State University of New York - Buffalo (occupational therapy)
Texas Women's University (occupational therapy)
University of Wisconsin-Stout (rehabilitation counselors; see above)
University of Virginia (biomedical engineering; see above)
West Virginia University

If you know of others please share your information with RESNA.

Accreditation

Some of the rehabilitation technology service delivery programs have gone through the accreditation process with the Commission on Accreditation of Rehabilitation Facilities (CARF). There has been discussion that DME suppliers are working on an accreditation procedure with the Joint Commission on Accreditation of Hospitals (JCAH); contact NAMES for more information. Information on CARF standards is available:

Standards Manual for Organizations Serving People with Disabilities. 1987, 130 pp., $25.00. Available from: Commission on Accreditation of Rehabilitation Facilities, 2500 North Pantano Road, Tucson, AZ 85715 (602) 886-8575. Also available is a Self-Study Questionnaire ($15), and a series of program evaluation publications which provide organizations with more information on how the guidelines and specifications can be used to develop, implement, and utilize a program evaluation system.

COMPONENTS OF A "HOLISTIC" DELIVERY SYSTEM

An excerpt from "The Holistic Application of High Technology for Conversation, Writing, and Computer Access Aid Systems." In Chapter One, Roger Smith refers to this paper written by Barry Rodgers which details the components of a service delivery system:

"The holistic application of a high tech aid system will require the following components:

1) Locating people who can make use of the aid system.
2) Establishing their needs and capabilities and the potential benefits of an aid system.
3) Selecting and acquiring appropriate system components including special market hardware and software, and general market hardware and software.
4) Making simple modification to hardware and software if necessary to make it compatible.
5) Assembling the aid system.
6) Mounting the aid system on the user's wheelchair, shoulder bag, bed, etc.
7) Fitting the aid system to the user including adjustments, modifications, and initial customization.
8) Selecting the most effective aid system training aids (manuals, video tapes, demonstration programs, etc.)
9) Initially training the user in the basics of the system and how to optimize it for themselves.
10) Training the people in the users environment who will need to help the user maintain the aid system.
11) Providing ongoing training to make sure users get all possible benefit from the aid system.
12) Being on call to answer subsequent questions about the aid system as it is being used.
13) Providing ongoing preventive maintenance and replacement worn-out parts.
14) Providing repairs.
15) Updating the system when significant improvements in available functions make it desirable.
16) Periodically evaluating the degree of integration of the aid system in the user's life and providing suggestions or further training as necessary.
17) Using information gained from users in the refinement and improvement of the aid system.
18) Providing a different more appropriate aid system when the user's needs or capabilities change.
19) Providing a different, more appropriate aid system when significant advances in aid system design make more useful aid systems available.

"Notice that only item #3 focuses on the hardware and software itself. The other 18 items relate to services to support the user and the system over time. This points out that when high tech devices are 'Holistically applied'

services such as systems integration and ongoing training will be at least as important as the devices themselves."

This paper appears in:
Technology for Disabled Persons: Discovery '84 Conference Papers. Christopher Smith, editor. Available from Materials Development Center, Stout Vocational Rehabilitation Institute, University of Wisconsin-Stout, Menomonee, WI 54751.

STATEWIDE SYSTEMS

Developing Coordinated Systems

Rehabilitation technology service delivery is an emerging field. There is no one, definitive model or exemplary program that can or should be copied as we attempt to meet the technological support needs of disabled individuals of all ages. Coordinated planning must take place on a statewide level to ensure that comprehensive services will meet the lifelong technology needs of disabled citizens of all ages.

A disabled person's need for technological support is usually a lifelong need. (You may only need to learn to drive once; but if you need one adapted vehicle, you will probably continue to need adapted vehicles. If you require a motorized wheelchair, it is not likely you will outgrow that need.) There are significant differences in planning for long-term vs. short-term needs. The rehabilitation system has traditionally focused its attention on shorter term and/or time-limited types of interventions. However, there is now an increased recognition of the importance of ongoing, coordinated support systems such as independent living and supported work. Technological support services and systems play an important role in these new trends that are redefining the entire habilitation/rehabilitation system. There has only been a single generation of severely disabled persons who have benefited from significant technological intervention. We are only now beginning to get a sense of the longer term issues that a comprehensive support system must address, such as: Where does the next adapted vehicle come from? How do you upgrade computer adaptations to remain competitive in the workforce as more sophisticated technology becomes available? What is a rehabilitation agency's role when former clients find they need financing for subsequent generations of equipment?

Before any action is taken, it is essential that each state coordinate the assessment of need, identify currently available resources and set realistic goals. Unified planning will reduce duplication of effort as agencies within the state begin to develop mechanisms for implementing appropriate technology services over the next years. It will also enhance the capacity for development of private sector rehabilitation technology services as the market for these services is better defined. If an agency such as Vocational Rehabilitation or Special Education remains the primary source for technology services, disabled individuals who have lifelong technology needs may have no place to go for their services when they are no longer agency clients. Although it may initially be a somewhat more complex procedure to find ways to get services established in the private sector, in the long run it is bound to be more cost effective for everyone involved. Disabled individuals will be able to obtain needed technology whether or not they are eligible agency clients. State agencies will be able to buy only what is needed, when it is needed, a capability that is usually lost when they are trying to provide specialized services with their own personnel. And a strong and responsive private sector strengthens the state's economic base.

A need and opportunity now confronts us to develop statewide systems for delivery of rehabilitation technology services. By necessity, each statewide system will and should take on an identity of is own. Efforts in each state should support and further develop those resources that already exist. Each state should then identify gaps in the system and make plans to systematically fill them. It should

draw on the legislative mandates and strengths of all agencies and parties involved in services for the disabled of all ages.

The state of Minnesota has taken a lead role in this type of coordinated planning activity. In October 1985, the Governor created a 19-member Issue Team on Technology for People with Disabilities to investigate the potential of high technology to improve the quality of life for Minnesotans with disabilities. Over the next six months, the Issue Team explored ways to increase awareness for users, the public, and professionals; to provide access to appropriate technology based products and services; and to fund research and development that addressed the critical needs in the field. In June 1986, a full report and Executive Summary was released with 12 specific Recommendations for Strategic Action. It concludes with future implications: "The next five to ten years will be critical to the shape of the future. Action must be taken in the areas of information sharing, funding, and research and development within a carefully conceived strategy that is fully supported with adequate human and financial resources. The costs of doing so will be far outweighed by savings in productivity, economic growth, and human dignity. We can afford to do no less."

Governor Cuomo initiated a Task Force on Technology and Disability in New York State which met for the first time in May 1987. The governor of your state could be encouraged to initiate a Technology and Disability Task Force, with representatives from both public and private sectors, charged with planning coordinated and integrated statewide activities related to technology for disabled people. The issues should be specific to your state, e.g., your task force may or may not decide to include research and development, focusing more on equitable distribution issues. It is recommended that the focus be broad, and not just limited to one area such as "high tech" or computers. The experiences related in this Guide and its companion document Planning and Implementing Augmentative Communication Service Delivery, demonstrate that we have the capability to develop effective, though often isolated, programs. We now have examples of programs successfully operating on a regional basis. It is hoped that we can rise to the challenge of this unique opportunity to build on previous models and experiences, so that a delivery system will emerge in future years that will truly benefit the population it strives to serve.

(This section was taken from material in: "Planning and Implementing Rehabilitation Technology Services" A. Enders, American Rehabilitation, Vol. 13, No. 1, Jan-Feb-Mar Issue, 1987. pp. 10-13; and from an issue paper on the "Implications for Statewide Program Development" written by D. Hobson, which is available from Mr. Hobson.)

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> Governor's Report on Technology For People with Disabilities--Abilities and Technology; State of Minnesota, Office of the Governor, June 1986.

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A PRACTICAL GUIDE

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